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THE FOLK APPROACH IN EXTENSION WORK

A Bulgarian Experience

by

Irwin T. Saunders

The Incident

One day in Dragalevtsy, a Bulgarian village of 1600 people, the mayor's courier went from house to house to inform all expectant mothers of a meeting to be held in the schoolhouse the next afternoon. The public health nurse from Sofia wanted to tell them about prenatal and postnatal care. Attendance, according to the courier, was compulsory. As he made his rounds, comments such as these flowed in his wake: "What does that mayor think he's doing? Making a public spectacle of pregnant women!" "I've already had more babies than that nurse will ever have. She can't tell me anything I don't know." By nightfall the women of the village, after discussing it over the stone fences between the yards, had decided that the expectant mothers should not attend the meeting.

The next afternoon two or three women did appear, women whose families felt under obligation to the mayor and consequently supported all of his programs. The mayor and the nurse were much disappointed, but dared not invoke the compulsory part of the courier's invitation. The nurse went ahead with her demonstration for the faithful few, but even these left the meeting much bewildered and quite disappointed. They told their friends, "We couldn't buy all the stuff she told us to buy, even if we should want to do everything she suggested."

The Problem

Incidents similar to this occurred so frequently during my three-year study of that village that I tried to discover what more effective approach could be used to bridge the gap between the scientific and the folk knowledge. The mayor and those assisting him were well-intentioned, but the people never seemed to apply the suggestions that the outside lecturers made. Accordingly, the lecturers became more convinced that the peasants were stupid, and the peasants became more self-satisfied with the ways that they already had. What was supposed to be *extension of the new* really became *extinction of the new* before it had time to take root.

The "uplifters", who frequently used the phrase *izdigane na seloto* or "the raising up of the village", were unnecessarily complicating their task. Instead of concentrating on the improvement of home-making and the encouragement of hygienic practices, which were their primary aims, they were also trying to change the women's meeting habits, or their ways of getting together. They insisted that the women leave their homes and come to the school for an artificially assembled meeting of a stiff, formal sort where they would be on the "receiving end", without the give-and-take of informal conversation to which they were accustomed.

As I sensed this difficulty I became convinced that the folkways already provided an avenue to the village women: namely, the *sedenka*, or "sitting", which is the name the villagers have given to the women's working groups.

The Sedenka

Allegedly, the main purpose of the *sedenka* is to help some women card her fluffy, newly-washed wool or to help her spin some of the wool into thread. Actually, it is recreational as well, for the women thoroughly enjoy sharing the gossip, the songs, and the food which accompany such get-togethers. Although these *sedenki* (pl.) seem at times to be hit-or-miss affairs, certain unwritten rules govern their activity. If a woman, for example, wants to have the help of her neighbors in carding her wool there are procedures she must follow.

1. She will select the guests quite carefully, inviting those who owe her work in kind or those to whose houses she wants to be invited when they card their wool. She rejects from the number those who cause ill-feeling, who stir up trouble or who are at odds with each other. Similarly she rejects those whose houses she does not want to visit in a "return

engagement" either because their food is poorly prepared or because they are dirty and slovenly in their housekeeping. At times she is prevailed upon by a close friend or a relative to invite some individual, who is not popular enough to receive many invitations, but who is anxious for the social intercourse that these occasions provide.

2. She will issue the invitations in the time-honored way. Although she may have seen two friends the evening before at the fountain and learned from them that they definitely plan to attend, she nevertheless goes to their homes before daybreak to call out in the crisp autumn air, "Anka, Anka." The dogs set up a terrific roar, and Anka finally appears at the door. "I'm having a *sedenka* today and I hope you can come." Anka accepts most graciously, while the walking alarm clock moves on to issue the next invitation.

3. She will prepare quantities of special food. There are certain dishes that are *sedenka* favorites. In the fall, one of these is *banitsa*, a soggy pumpkin pie two feet in diameter. A stew of beans or one of meat and vegetables is often popular.

4. She will see that the activities at the *sedenka* flow along normally. There must be enough of the comb-like affairs, long spikes set in a small wooden frame, through which the wool is drawn. The women in all parts of the room must be kept supplied with wool. Mealtimes must come at the prescribed intervals, and the good conversationalists must be urged to repeat some of the latest news, while those who consider themselves singers must be encouraged to start a song. And so the day passes. The women have arrived in the morning as soon as they completed their morning tasks, and they stay until mid-afternoon. At other times, however, a smaller group assembles in the evening for four or five hours of enjoyment and spinning.

Needless to say, these *sedenka* groups are powerful agencies in the dissemination of news and in the formation of village opinion. After a day spent in one of these sessions a woman has a supply of "small talk" sufficient to last her for two or three days in conversations with those who did not attend this particular gathering.

Good Extension Principles and the Sedenka

The specialist who uses a *sedenka*, whether especially arranged for her or not, would be following good educational and sociological practice.

1. *She would be bringing people together in a familiar environment:* that is, one of the village homes. There would not be the strangeness of the schoolroom nor the distractions of completely new surroundings. Instead of having to adjust to a new place and a new person (the speaker) the women would play the role of hostesses and expect the speaker to adjust to them.

2. *The people would already be accustomed to meeting with each other.* Any newly-formed group needs an exploratory period in which the bolder individuals try various things on the group to see what meets with favor and what with stony indifference or frank disapproval. In a *sedenka* group, people already know how their remarks and their questions will be received, which is a matter of much importance in a learning situation. Among people who do not know each other well an ill-advised laugh at a sincere question can kill the chances of a lively, helpful, whole-hearted discussion. The congeniality of the group is further assured by the fact that the hostess is able to use a selective technique which weeds out the incompatibles. Fortunately, these "incompatibles" are usually compatible in other groups where they have much in common with their associates in these groups. Therefore, every village woman could be reached in some *sedenka* grouping.

3. *The demonstration agent could use the artifacts of the village home to good advantage.* As far as possible the demonstration should be built around what the women already have, for that is what they must use if they follow the speaker's suggestions. The average village home would not spend more than four or five dollars a year on furnishings, utensils, and the like, nor could one expect them to spend more than this out of the meager budget on which they operate. Demonstrations then should be worked out not so much to illustrate the ideal but to show how present practices can be improved with the utensils already at hand. If this is done the village women no longer could say, "Oh, I can't do that for I don't have all those things the stranger had."

4. *Local leadership would be recognized and used.* A great mistake, too often made, is the assumption that the mayor[1], an outside governmental appointee, is the leader of the village in all respects. Every activity has its own local leaders. By skillful questioning the outsider can learn which women are most respected in their particular neighborhoods. Each of these could be asked to call a *sedenka* together for her neighborhood at a time convenient

1. The national government which came into power in May, 1934, sent engineers and lawyers and other educated people into key villages as mayors to supplant the local peasants, who had been elected by their fellow villagers.

both to the specialist and the women. Before they sponsored any such novelty the leaders must be convinced of the worthwhile nature of the activity; and can then be taught to assume an important part in the demonstration.

5. *The new proposals could be fitted more easily into the fabric of everyday life.* Not only must the women be given the techniques but they must be given an ideology to accompany those techniques. They must have an answer ready for the doubting husband, the curious neighbor, the pooh-poohing mother-in-law. They must see that what they are asked to do bolsters up rather than tears down those social values which they consider essential to their way of life.

To illustrate, we may return again to the matter of postnatal care. Expectant mothers in Dragalevtsy hesitate to prepare layettes for the infants in advance. They feel that such behavior, presuming as it does that the baby will survive, would anger the powers that be; women must expect the worst because the worst so frequently occurs. This is a fundamental fact to be reckoned with in the teaching of infant care. Most public health nurses recognize this difficulty, but many try to eradicate it by telling the women how superstitious and how silly they are. The more positive approach would recognize the limitations and try to do at least these two things:

a. Insist that clean cloths, soap and all other available equipment needed at childbirth and in early infancy be prepared and set aside in advance. None of these cloths should require sewing, since all pregnant women are forbidden to sew.

b. Tell the mothers-to-be how they can make simple, hygienic garments as soon as they recover sufficiently from the delivery, for there is no *tabu* against such action then. Once they understand how to make and use such special garments in place of the unsanitary swaddling clothes some of them will prepare them in advance in spite of the *tabu*. A few of the up-to-date mothers-in-law may also prepare these garments in advance, at the same time forbidding their daughters-in-law to sew.

The value of such an approach lies in the avoidance of a sharp break between the old and the new; instead, the two are blended. Social changes occur without the people feeling that such changes threaten their mores. A most important point, then, in fitting the new proposals into the fabric of everyday life is the scrupulous forestalling of a clear-cut issue between the old and the new whenever that is possible. There are times, to be sure, when some champion of the old challenges the new, and the specialist must meet the challenge with everything at his command. However, the specialist must never seek to destroy the old because it is old; nor should he initiate an "either - or" choice for the peasant.

Application and Evaluation

I used the *sedenka* to serve a purpose of my own in an experimental fashion but the Bulgarian extension people to whom I broached the matter were a bit reluctant to use the *sedenka* for at least three reasons:

1. They had their eyes turned to the west and mistakenly thought that what they *imported* was better than what they *already had*. In other words, making use of the local groups would have seemed a step backwards rather than a step forwards. It just was not the modern way to do things, and they were out to "modernize" the village.

2. They had been "bitten" by the attendance bugaboo. They had to get a big "turn-out" so they could add up impressive figures when they reported the event; their supervisor had to use figures to impress the one above him; and so it ran up the whole hierarchy. Then, too, the workers themselves began to measure their own success in terms of attendance. Of course, if such a measure is used it is ridiculous to get twenty or twenty-five women together in a home when you could get fifty women together in the school. Unfortunately, such individuals are bewitched by the fallacy that exposure means education and the more people exposed the greater the education.

3. A few extension workers realized that they would not be as much the master of a *sedenka* gathering as they would of a number of people arranged in chairs, all ill-at-ease and everybody afraid to speak up. Those who lacked self-confidence in their own training, or in their ability to handle questions did not want to be put in the position of having to say that they did not know the answer to some query. This was partly the fault of their training, as well as a failure to evaluate properly the goals for which they were striving.

One day I asked a woman named Sandra if she would let me come to a *sedenka* at her house. She made all arrangements, invited her friends, and prepared some food. All the women brought their own handwork. Because I was investigating at this time the relationships of the Bulgarian family, a Bulgarian woman teacher and I spent about four hours guiding the discussion around the roles of the husband, the wife, the child and the in-laws. Over and over again, I thought of the excellent educational

opportunities such an occasion offered. In fact, I had to answer almost as many questions about America as I asked about Bulgaria, and the teacher was asked many questions which would never have been raised in a schoolroom. The topics covered ranged from how men treated their wives in America to what one did for a bad sore on a child's mouth. There were many informal conversations going on much of the time among pairs or trios of the twenty-five women, but when some particular question proved of general interest the conversation would stop and all would listen attentively.

I know that this gathering at Sandra's home was not a fair test of the *sedenka* as an extension aid; however, this experience and experiences with at least twenty-five other *sedenka* groups convinced me of the rich possibilities these groups afford.

For those interested in the problem of finding a way through cultural barriers this particular study can be merely suggestive. What succeeds in Bulgaria will not necessarily succeed elsewhere, but surely some of the principles will apply. Few of us utilize sufficiently the avenues a culture affords; instead we want to travel pathways of our own blazing, often leaving our followers lost far behind. It is much better to start where the people are already, and move with them down familiar paths, pointing out ways the old paths can be improved. Sometimes drastic alterations will be necessary, but these should only be decided upon after the possibilities of the "blended approach" have been carefully considered.

POSSIBILITIES FOR IMPROVEMENT AMONG RURAL PANAMANIANS[1]

By

Ofelia Hooper

For several years I taught and worked among the primitive rural people of Panama. These years were full of heartbreaking observation and uphill but rewarding effort. Then I had a chance to come to the United States, under the auspices of the Coordinator of Inter-American Affairs and train for a year, in subjects related to rural economics and sociology, with the Bureau of Agricultural Economics in the United States Department of Agriculture.

This year of study, observation, and practice is now nearly over. I came to this country with rather definite ideas as to what my rural people needed, what I hoped to learn here for their benefit, and how I hoped to work with them to better advantage on my return. As that time draws near I take out those ideas and match them against my year's experiences and begin to formulate a somewhat readjusted tentative program for applying my new and invigorated knowledge and outlook to the betterment of the barefoot rural people of my country.

Contrasts in Population

To understand the conditions under which I shall work you will want to hear more about these barefoot people. Of course they and their circumstances are entirely different from the ones travellers see in the cosmopolitan cities of Colon and Panama. In these cities the people have long bought and sold with ships from all over the world and with the many who live and work in the Canal Zone. But the country people live a life apart with almost no connection with their own cities.

Even before the war this condition of contrast was changing. The Government of Panama had begun to work toward the alleviation of the people in the country districts and toward the gradual welding together of these two diverse elements of the nation. Then came the war which cut off many of the supplies for the cities. With a food shortage threatening them, the city people and the Government turned to the farmers of Panama and to the unused land as possible sources of food.

Efforts of the Government

It will be evident that these renewed efforts on their part will have dual benefits: they will help to make and stabilize a local source of food for the city populations and they are bound to improve

1. Editor's note, Caroline B. Sherman, of the Bureau of Agricultural Economics, USDA, prepared this article from several manuscripts written previously by Miss Hooper. The original style of the author has been retained as far as practical.

the farming, incomes and living conditions of the rural people while doing it. The few trained agriculturists and home demonstrators who were already working with the rural people have an added incentive and hope, now that the cities will make a market for any surplus the people may raise. But the rural people themselves need far more and far greater diversity than they now raise.

Rural Conditions

Of the half-million total population, rural people make up 67 per cent. These rural people cultivate in a primitive way about 32 per cent of the 33,000 square miles of the total land of Panama. But they have been producing only for themselves, as a rule. Occasionally they sell a few animals. Their cattle are sold at the end of the dry season when they are in poor condition so the prices are very low. The buyer fattens the cattle for market and gets good prices.

Ways of rural people have remained rather stationary through the generations. Among the common people there are no race distinctions. This has caused some of the people in the white countries of South America to speak of Panama as one of the "nigger countries." Panamanians may be proud of the "Hispano" elements in the culture of South America, when they know of it, but in their own culture there is no place for race superstitions. Many realize that dark-skinned citizens have helped or are helping to build up the nation and occupy important positions.

The traditional attitude of rural Panamanians toward land illustrates some of the barriers to rural progress. For centuries, in spite of instruction and laws, they have believed that the land belongs to the people collectively and not to individuals. It is for their use, they believe, but they must not own it individually.

Many legal regulations regarding land that Panama has issued and carried out during the last four centuries, files of court decisions to settle disputes, and knowledge of how the land actually is owned and/or used both by the barefoot farmers and by the landlords -- all these things illuminate the thrilling struggle which has been going on for centuries between the barefoot farmers who practice community ownership of land and the landlords who practice private ownership of property. The landlords enjoy economic and political power; this is reflected in the fact that all the legal regulations and court decisions have been framed with the protection and encouragement of private ownership in mind.

The traditional attitude of the barefoot farmers has been a barrier to progress in an economic system which discourages community endeavor but it can be a power for good in a system that is willing to encourage and develop community or cooperative enterprises. For about 15 years the Government has offered to give the country families tracts varying from 15 to 20 acres to have and to hold, but the farmers try to avoid ownership. They persist in renting from the Government or they may use public land without paying rent. There are legally registered titles for only 26 per cent of the total land area. Of the registered land 67 per cent is owned by 50 landlords and the remaining 33 per cent is owned by approximately 12,000 farmers.

Certain acts in this long drama of the land stand out above the others.

(1) Loss of the community land by the conquered Indian farmers.
(2) Purchase of community land by certain communities from the King of Spain in 1795.
(3) Appropriation of the community land by the national Government of Panama in 1929 after asking, through the newspapers, that barefoot farmers and landlords produce these deeds to all land held by them. Many private owners could produce their deeds but no community could do it.
(4) Later sale of public land by the Government to anyone, including barefoot farmers; these sales virtually make peons (on the landlord lands) of the families that had long been collective farmers on community lands.

The people do not know what is wanted in the world outside. They have no markets worthy of the name. They are not anxious to make changes nor do they care to live very differently from the ways of their fathers. But some of them have responded well when efforts have been made to improve their conditions.

Crops can be raised in only half of the country and during only half of the year. A great backbone of mountain ranges divides the country down the center. On the Atlantic side there is plenty of water but the thick growth of the jungle makes farming almost impossible. On the Pacific side the dry season lasts for six months and there is no irrigation. But even though the usable portion is thus restricted, Panama is using only about one-third of its agricultural capacity so considerable expansion in production is possible.

The average annual cash income of rural families was $13, in 1940. From this the Govern-

ment was to be paid for rent of land (about $1), a tax was to be paid for slaughtering animals ($4 for a cow, $1 for a pig), and there were the fees for religious ceremonies. Clothes and tools and perhaps the doctor called for small spendings. When the families cannot pay for services they usually go without them. In some instances the marriage ceremony is postponed until the children of the family can help to pay for it.

At the Turning Point

Let us use again the familiar figure of the economic ladder. Any real help in the agriculture field should send tenants and owners of the land one step up the so-called economic ladder and benefit the whole rural population. To lose place would mean that 67 per cent of the population would be reduced to the condition of laborers in a colonial economic system. The rural people cannot remain in the middle of the ladder. The world situation is now such that they surely will be pushed. The question is, shall the direction be up or down? It is a very real question and an insistent one. The future economic and social welfare of the rural areas will almost inevitably be determined during the next decade.

The Department of Agriculture of Panama hopes to help the people to go forward. It hopes to organize and influence the productive agricultural resources of the country. But it is not as well equipped for this work as it might be. It does not have specialized agencies. It has a few men who are technically skilled; they must use the weapons of research and planning. Then there are few men and women who work with the rural people, somewhat as do the agricultural extension workers in the United States. The Department plans to strengthen and expand both lines of work.

The Rural Social Scene

Let us now visit some of the places and families they will work with. Several years ago, as a teacher in the rural schools, I would visit the scattered families who live in bamboo or clay huts with thatched roofs. Perhaps you will now make those visits with me; in this way I have taken several groups of your countrymen into our primitive rural places. In scattered forest clearings we shall come across their homes. Sometimes we shall find bamboo walls and sometimes no real walls. Fibers and vines may be used instead of nails. The floor is the bare earth and the open fire for cooking is in the center. Skins and wood make the few pieces of furniture and the few utensils and skins or blankets are used on bamboo beds.

In the small home plot are usually a few coffee and fruit trees for permanent sustenance. But each year the family abandons the so-called cultivated spot on which it grew a few crops and hacks another piece out of the woods on which are planted a little corn, rice, root vegetables, peanuts, sugarcane, or tobacco. The quality of the soil influences the choice of crops which are planted with sharp sticks and are weeded only perhaps a couple of times. The people have never learned to cultivate land intensively, or to build it up, or to crop it permanently.

Attitudes Toward Improvements

My best illustration of their needs and how they were met in those days has to do with malaria. One day when I was visiting among my people I saw a family of malarial and undernourished children and some lean dogs and pigs crowd longingly around the mother while she cooked a small dish of cassava in a damp dirty house. Later I saw the same children in school shivering with malaria while the teacher was giving a lesson on the Italian Renaissance. Yes, this really happened. I made up my mind then that my teaching would hereafter be intensely practical, aimed to improve daily living, and that my spare time would all go to home visiting.

On these visits I tried to get the families to raise a few chickens. I got them seeds from the Department of Agriculture and the Canal Zone Experiment Garden, and advice from both places. These organizations helped me to introduce a better yielding variety of sugarcane and sweet potatoes and corn that were immune to local diseases. Some of the families reluctantly planted some vegetables that were new to them to extend their diet. They planted only to please me but gradually they learned to eat them. We planted the seed for trees that have since grown to be of some value -- both mahogany and orange trees.

Even these small efforts often failed through inexperience on all sides and through indifference on theirs. But I like to remember that I did actually help the pupils to get better food instead of merely telling them or their parents to have better food. And I believe that the small improvements we managed to bring about show that under trained guidance some real advancement in health and comfort are possible.

Our attempts toward sanitation were active but not integrated. We emptied and buried tin

cans and bottles that collected stagnant water. We opened up a little natural hillside drainage, and poured oil on other places. Then I appealed for help from those higher up locally who were better trained. But I was sharply reminded that teachers were not hired for drainage and health. The National Government and a few others encouraged the work and conditions have changed enough so it is probable that such discouraging local responses might not be received under similar circumstances today.

Illustrating the need for sympathetic local teaching is my true story about the quinine pills. The rural people believed the quinine that the Government was selling in the schools, at cost, was poisonous. After I named the stock of 17,000 unused pills "Government medicine" interest was awakened. The pills sold well and were really used -- and they certainly were needed.

Later, when I was teaching in the city and was working on health with my pupils and their families I did not have such hindrances from higher up, but had effective help and a better response from the families.

Prevalence of Hampering Conditions

Malaria is found everywhere and so is undernourishment. Only of late, in rural areas, has there been any effective control of disease. Striking evidence of this is found in the fact that whereas babies in the United States are able to hold up their heads practically from birth, the rural babies of Panama cannot hold theirs up until their eighth week.

Then we have the evidence among the laborers in the Canal Zone. The Panama Canal requires that the hand laborers from the Republic of Panama working for the Canal, have a minimum height of five feet, a minimum weight of 100 pounds, and an acceptable set of teeth. Some of the adult male Panamanian hand laborers are unable to secure a job in the Canal Zone because they are deficient in all these respects -- in a few cases they have weighed only 87 pounds.

The Year in the United States

As to my studies in the United States, I decided in the beginning to have them just as practical as possible and when it came to observations to seek out conditions as nearly like those in Panama as could be found.

After a short period of theoretical study and getting acquainted at first hand with certain programs for rural betterment that stem from Washington, and the people who administer them, I set out for the southern and southwestern fields, and I have been there about the most continuously.

Most of my time and study has been given to home life and home-improvement farming and to the actual services being offered to and used by rural families in the South and Southwest. In all, my studies have included the plans, methods and services either in Washington, at the State level, or in the field of the Bureau of Agricultural Economics, the Extension Service, Farm Security Administration, and Soil Conservation Service all in the United States Department of Agriculture, and the Bureau of Indian Affairs in the Interior Department. I have seen the work go out from the centers and I have lived in rural homes and seen the services come in, and have observed or taken actual part in the way they operate. This has included work in the homes, observing small farming, and studying small cooperative endeavors; it has included watchful attendance at discussion meetings, at 4-H, home demonstration, and agricultural meetings; I have visited regular and special classes in vocational schools, and attended church services and church organization meetings. The activities of some of the war units have been studied both in plan and operation.

Throughout, I have studied constantly as to how much of the general philosophies back of all these activities can apply to the conditions in Panama, how much the methods would have to be modified, and how well they would work even then, and how much alike or different the short and long-time objectives should be. As I have developed knowledge and confidence I have asked for chances to conduct some of these meetings in Arkansas, to gain additional experience in local leadership methods.

How to Apply What I Have Learned?

How can I best apply what I have learned and observed, to be of best use to my people and my country? What do my people need most and what of all this can they best learn to use in order to rid themselves of their worst drawbacks and gain some sure improvement in living?

To these pressing questions I am formulating some very simple replies. Often it will be other people who have more specialized training who will actually carry forward the work.

First, I should encourage the rural families themselves to see what their needs are, in production, in cash, and in home and farm improvements. Then I or someone should help them to fix practicable goals to work toward, and help them see what the obstacles will be and how to attack them so they will

not be too much discouraged when these obstacles appear. They must try to see where they are going now and where they want to go.

Helping them actually to work toward their goals will be largely in the hands of others in the Department of Agriculture who are differently trained. I should be able to prepare the farmers to listen and to try, and to prepare the rural women to take advantage of the work of the home demonstration agents, and to enlist the interest and awaken some enthusiasm in the youth, toward all these things. Perhaps I can help to find and encourage potential local leaders. And always I must not miss any good chances to teach the rural families of all ages the elementary things about good diet and what it can do toward building up health.

Outline of Problems

The problem seems to be not necessarily a lack of sources of protein, but of lack of improving, increasing, and using the protein supplies. Cattle, hogs, poultry, fish, sea food, wild game, beans, avocados, breadfruit, "pixbaes," "nances," "corozos," coconut, peanuts, cashew nuts, and cocoa grow in Panama. But some rural Panamanians regard avocados as hog feed, for instance.

Lack of education plays an important part in keeping the people from using proteins in their diet, but there are other influential reasons for it. It is estimated that the dairy industry is using, in Panama, 100 acres of land per cow in its unconsciously wasteful and extensive way of using pasture. The milk production averages 1/4 gallon per day for each cow. Prices for milk are exorbitant and sometimes a children's or a doctor's certificate is needed, in Panama, to gain the right to buy milk. The barefoot farmers, living in a subsistence economy, do not know butter or cream. Hogs that are raised in the hills must walk the great distance to the highway or to the oceans, where trucks or boats haul them to the towns. Fat hogs cannot do this so the farmers who want their hogs to reach the markets must keep them from getting fat; it takes from 3 to 5 years to get them ready for the market. Rural people do not know how to cure the pork so they do not have hams and bacon even though they may raise a hog or two.

Eight out of every ten chickens hatched in Panama die before being ready for home consumption or for the market. Prices for eggs and chickens are correspondingly high.

As there are no rural roads the farmers living a good way from the nearby oceans cannot get fish and sea food. Dynamite is used when fishing in the rivers.

Commercial propaganda for canned food and the occasional wages from the Canal Zone are bringing into Panama - a country of fresh year-round vegetables and fruits that should be used abundantly - an undue supply of processed foods.

Rural farmers in general do not feed the livestock, partly because of the ever-green tropical forest. These forests and the natural ranges provide enough food to keep the livestock from elimination by starvation, but do not provide them with the food necessary for them to feed, in turn, the people. Livestock feed is not raised by the farmers in Panama. So, although they have year-round livestock feed, the people of Panama turn for their meat to cold-weather countries that can grow feed only a short time.

Outline of Attack

Simple plans for developing adequate knowledge and practice of growing and feeding cattle for home use and consumption in Panama must be devised and set going.

For a local livestock industry the farmers would need better breeding through better sires, and would need fences, and water supplies. They might get these through private enterprise or Government enterprise, or cooperative enterprises. After observing the livestock cooperative enterprises in New Mexico, at Isleta, Pueblo, Sangre de Cristo, Ortiz, Caja del Rio, and elsewhere I believe similar undertakings are needed by the rural people of Panama.

To improve and increase the protein supply some Panamanians are importing baby chicks and chicken feed from the United States. This seems not to be the practical way to improve the poultry industry. The barefoot farmers, with a yearly cash income of $13 in U. S. money or the rural people who have a yearly cash income of $60, or even the urban population with a yearly cash income of $500, should not have to pay for the chickens themselves and also for the profit of the private enterprises which sell them, and for the airplane transportation of the baby chicks. We must teach the families to raise a few chickens, to feed them for growth and for laying, using locally grown feeds. For Panama has fish, coconuts, oyster shells, and other good products for such use.

I would suggest a remedy about as follows:

1. Establish a chicken Experimental Station, as a branch of the University of Panama, to investigate

the handicaps and the possibilities for the poultry industry, and charged with finding practical ways to overcome the troubles and develop the possibilities.

2. Develop laboratories with facilities, available to the barefoot Panamanians as well as to the poultry raisers at minimum of trouble and at cost, the necessary blood test for the hens that are laying eggs for hatching in order to avoid the infectious diseases that are killing the chicks so badly in Panama.

3. Develop an incubator to hatch the baby chicks the poultry raisers want to buy from hatcheries, and the sale of chicks at prices the barefoot farmers can afford to pay.

4. Develop a chicken-feed factory to use the fish of our oceans, the coconuts, the oyster shells or bones available in Panama, and the grains the farmers raise or whatever the chicken specialist will decide is good for feeding the chickens. This factory must be able to sell the chicken feed at a price the barefoot farmers can pay.

5. Develop a credit institution to provide small credit, not charity, to the barefoot farmers.

6. Develop an educational agency to induce the barefoot families to use the facilities available to them in raising chickens for use at home especially and perhaps to sell for local use.

Unless the rural families can have access to the work and the practical demonstrations of experiment stations that are manned by competent livestock and poultry specialists who are really interested in rural improvement not much can be done by or for them in this direction.

Land use is a problem that the Government is already tackling. It is one that must be solved soon, in one way or another, if rural progress is to be made. As public land comprises nearly 74 per cent of the 33,000 square miles of land in Panama and as the farmers are not used to the private ownership of the land, but ardently believe in the collective utilization of the land and as they have for centuries certain cooperative practices, it seems that cooperative ventures in livestock growing and feeding should come natural to them. Since they already consider the land as national property and are not cordial to the ideas and efforts toward individual ownership, to change the holding and using of the land from the national government to a community enterprise might easily be the answer to their land problems. The national government can legally sell the community land, and this is actually happening. A community enterprise will save the land for the farmers who live in the community who want to use the land but do not care or know how to own it. To change the ownership of the land from the national Government to a livestock community enterprise would not be a radical change; it would fit in with the long-established practices of using the land collectively. Under such a plan the fees the barefoot farmers are now paying to the Government for the rent of the public land would remain in the community, as fees paid to the livestock cooperative. They should be used in satisfying the local needs as designated by the rural families and in the way the community feels should be used, to stimulate the initiative of the people. Any successful cooperative enterprise should be on the look-out for ways in which to encourage education and community efforts toward local and family improvement.

Probably the mesas of Chepo and Macaraquita in the Peninsula of Azuero, where national lands with very good pastures and water supplies are available, offer the facilities required in establishing some livestock cooperatives for the local people of these mesas. And there are perhaps other places as promising.

Credit plans worked out so they will be practicable for these people of primitive ways should be used, for these families are not accustomed to charity, do not want it, and should not be made acquainted with it.

Some Promising Indications

There are some signs that look promising for success in these lines of work:

First, and most important, the Government of Panama is interested and intends to get some results. Through the new agricultural policy of the Government a few home economics workers are already reaching some of the isolated settlements and some of the still more remote rural families, showing how to improve their homes and diet. Naturally, they find they can teach the families best by working with the young people. They will encourage the families to plant more and better crops, to cultivate more, and the canning and storing of food will be taught. Rural organizations like the 4-H clubs in this country will be formed. Rural sociologists are now studying the peculiar characteristics of our rural population, are studying their habits, customs, and institutions. They are already trying to interpret them to the Nation. They realize it is necessary that each part of the population understand the other and that a real attempt should be made to bring both elements together to make a united country, economically.

Then there are the cooperative leanings of the rural people. Besides their attitude toward communal use of land we have to consider the traditional junta which is their long-standing and actively used form of work-and-play cooperation. For years immemorial, when a family has wanted to get done a heavy or time-consuming job it has invited all the neighbors to come and assist. The plan is much like the working "bees" that once flourished in the United States. A house may be constructed or some forest may be cut away or poisonous snakes may be driven out or killed. The boys and girls learn from the men and women, experiences and news are swapped. Work is finished and play begins. For it is a social event as well. There are no discriminations as to race and color. Always the prettiest girls and the most popular men are invited first. Flirtations and love affairs are begun or advanced. In fact, the junta is the motivation and the means of much of the development of family and such community life as can be discerned. Here is the spontaneous center around which present-day cooperative work can be built and expanded. Only sympathetic remodeling and redirecting are needed, plus a content that will be attractive and still more useful to the people.

Third, we are hearing now about the agricultural development stations that are being started in Latin American Republics in cooperation with the United States. Among the Republics that have already signed up for them or have them underway are Peru, Ecuador, Nicaragua, and El Salvador.

And we are hearing about the possibilities of an Inter-American Agricultural Credit Bank. I do not know whether this would have operations that would reach the rural farmers but certainly if it comes, it will improve agricultural credit matters, generally.

Finally, we have the independent rural families of Panama who are used to standing on their own feet and getting what they need through their own work. They must be taught to want more in the way of diet and health and more of what you and I call the necessities of life; but at the same time, if they are shown how, they will expect to work for them. They are used to holding up their heads as adult people and getting along with their neighbors and their Government. Now we must teach them how to live so they will hold up their heads even as infants through good nutrition, and how to live so they can be normally well and strong at home, or can get the jobs that would be available to them if they had good average health and growth.

RESISTANCE TO FREEDOM -- AN ADMINISTRATIVE PROBLEM

By

John F. Embree

Beginning in March 1942 and continuing until November of the same year, approximately 107,000 persons of Japanese ancestry were evacuated from the West Coast. They moved first to hastily prepared quarters in "assembly centers", such as race tracks and fairgrounds, then into equally hastily prepared "relocation centers" scattered from California to Arkansas.[1]

The War Relocation Authority, concerned with administering relocation centers and relocating the evacuees, has been working out procedures for getting evacuees out of relocation centers and back into American life. In general the policy makers of the Authority regard this as essential for three fundamental reasons:

1. Brief accounts of the evacuation may be found in J. F. Embree, "The Relocation of Persons of Japanese Ancestry in the United States: Some Causes and Effects," *Journal of the Washington Academy of Sciences*, Vol. 33, No. 8, August 15, 1943; Galen Fisher, "Japanese Evacuation from the West Coast," *Far Eastern Survey*, Vol. II, No. 13, June 29, 1942; Alexander Leighton and others, "The Japanese Family in America," *The Annals of the American Academy of Political and Social Science*, September, 1943. Much of the data in the present article was first presented by the author as Community Analyst for the War Relocation Authority to W.R.A. administrators in connection with the administrative problems of relocation.

a. Most of the aliens and citizens of Japanese ancestry in the United States will continue to live in this country after the war.
b. The rights of citizenship and the rights of law-abiding aliens are closely associated with American war aims.
c. Assimilation, which includes the development of attitudes of loyalty, cannot be developed in the isolation of a relocation center or in an atmosphere of hate, suspicion and fear.[2]

After long and complex procedures in regard to internal security, community acceptance, and job placement, the time finally came, about May of 1943, when there were many opportunities for evacuees to leave the confines of the centers and take up life in the East and Middle West. At this juncture, the Authority ran into the new and unexpected problem of resistance to relocation. The evacuees, living with whole families in single rooms, eating in public dining rooms, washing in public washrooms, subject to dust storms, desert heat and frigid winters, did not want to move.

Why?

The answer to this question is not a simple one, for the problems involved are many, involving as they do administrative procedures, public attitudes and evacuees' past experiences and present attitudes. In this paper attention will be paid to only this last aspect of the problem of the slow rate[3] of relocation, an aspect that may be expected to increase in importance, namely the basis of present negative attitudes toward relocation on the part of evacuees (as of May 1943).

FEELINGS OF INSECURITY

Basically, most of the factors in the problem are associated with feelings of relative security or insecurity. The initial reluctance of evacuees to relocate was associated with deep-seated feelings of insecurity in regard to life outside the center, together with the development of feelings of security within a newly organized society inside the center.

The whole evacuation and relocation center experience resulted in a drastic social disorganization followed by a gradual reorganization. Profound personal psychological upsets and severe social disorganization attended the actual evacuation. On short notice, after weeks of acute uncertainty when the West Coast was filled with fear and hatred of Japan and all Japanese, Issei and Nisei[4] alike, were suddenly ordered rounded up like prisoners of war and herded into assembly centers. This order, together with the internment of many Issei community leaders, left the social organization of the people badly broken. In addition, the Nisei lost at the stroke of a pen the security they thought they had in their American citizenship. For the older people, economic security was gone and the gains of years of work cultivating a farm or building up a trade or profession were wiped out. In addition, the Issei had their hopes for their children's future in this country severely shaken.

The evacuation experience just about knocked out the initiative of the older Issei. They were just about to retire when the war broke out and today they want nothing better than to be let alone. The Nisei, the majority of whom were between sixteen and twenty-four years of age at the time of evacuation, were also deeply affected by the experience, but due to their youth and greater adaptability to American cultural patterns they formed better prospects for relocation than did their parents. However, they felt insecure in many ways and still felt a need for their parents' guidance and advice.

SOCIAL REORGANIZATION

Relocation centers began, then, with a badly disorganized lot of people. But human society

2. These points have been made by the Director and other W.R.A. officials in both private conversations and in public talks.

3. By slow rate is meant a rate slower than that necessary for the majority of the evacuees to be relocated before the end of the war -- say, within three years. As of May, 1943, the rate was about 2,000 per month, a rate which would require about nine years for complete relocation of the population in the ten centers. By October the rate had fallen to about 1,000 per month.

4. Issei means first generation, i.e., those born in Japan. Nisei means second generation, i.e., those born in the United States of Japanese parents.

abhors disorganization, and in the course of the months since evacuation, new social forms were developed and old ones recreated. The family in particular gained strength as a result of evacuation, in the sense that family members depended on one another for the lack of other stable groups. Thus the Issei-Nisei cleavage which was growing before evacuation was in some ways reduced.

After the initial shocks and the early unhappy attempts of youthful Japanese-American Citizens Leaguers to run the centers, Issei control re-emerged. With a Nisei population, young and inexperienced, this was bound to occur. The strike at Poston in November 1942 was, according to the community analysts there, a crisis which ended with a reorganization of the society along more stable lines. Local block and neighborhood public opinion re-emerged to control individual behavior in the centers -- a development not realized at first by the W.R.A. staff, and looked upon as subversive by some.

Thus, there grew up a new social structure to replace the disorganization of the previous summer. That meant a new stability and cohesiveness. The relocation program threatened this new equilibrium and the society was bound to resist this threat to its existence, just as it resisted a registration program[5] which carried in it the suggestion of relocation and segregation; i.e., the suggestion of a new moving of people and breaking of social ties.

Specific Bases for Evacuee Resistance to Relocation

1. *The problem of making up one's mind.* For the resident of a relocation center, the decision to relocate is an important one, one which he realizes will affect his whole future.[6] Relocation, like marriage, is not to be undertaken lightly. It requires much talking over and family consultation. Coming to a final decision is made more difficult by the fact that all recent decisions of a similar nature have been made for him by the government -- i.e., the moves to assembly centers and to relocation centers. The feelings of insecurity resulting from evacuation also contribute to the difficulty of arriving quickly at a final decision on a matter so important to the future life of the individual concerned.

2. *Fear of breaking up the family.* As already indicated, with the initial breaking of so many social ties, individuals have turned to family relationships as something stable. Many individuals are reluctant to relocate for fear of breaking this tie as well. The older parents are reluctant to let their children leave them, especially their daughters. It is, for instance, against the Japanese tradition of parental duty to let a daughter leave home before the day of her marriage.

3. *Fear of losing companionship and status.* The center, bad as it is in many ways, does provide companionship. The evacuee is one of a group of evacuees in the same boat. In the center he is, in a limited sense, one of a majority, whereas on the outside he is one of a minority. On the outside he will be alone and will lack the companionship of others with the like experience of evacuation behind them. This lack of companionship is especially felt by those who are young and unmarried. Within the center, one has a status, a position in society such as being a block manager, a council member, or a judo expert. Within the center, there is also greater opportunity for young people to find suitable mates and spouses.[7] All of this is lost on relocation outside the center. The relocation center provides, in a broad sense, a social security for the individual.

4. *Fear of discrimination.* Stories of discrimination come back to the centers. Not only are the Nisei fearful of discrimination they may meet, but also their parents are fearful for them, remembering what they have been through themselves and realizing that the nation is now at war.

News stories in the press add to this fear of discrimination, as do anti-American Japanese resolutions in Congress, in State Legislatures, and by organizations such as the American Legion. The Dies Committee looms larger and more real to the evacuee than do constitutional guarantees of personal freedom and security.

5. *Financial insecurity.* While it is true that some evacuees are wealthy, the majority have suffered severe financial losses as a result of evacuation and are still having their resources depleted so long as they have to maintain any reasonable standard of living on sixteen or nineteen dollars a month.

5. In connection with an Army program for accepting Nisei volunteers and a W.R.A. Employment Division program to speed up leave clearances.

6. Since most of the factors outlined in this section are still present in the relocation center situation, the present tense will be used throughout.

7. It is perhaps worth noting that thousands of contraceptives are purchased monthly by center residents.

LIBRARY

In addition, extreme stories of the rise in prices on the outside and the complications of rationing, cause people to hesitate before deciding to relocate.

This financial worry is a serious matter. The Issei in particular, who managed to overcome financial insecurity over a period of twenty or thirty years, are old and have not the heart to begin over again. Many Nisei are willing to take the financial risk for themselves if they can rest assured that the government will provide security for their parents, but they cannot be sure of this. At any time W.R.A. or Congress ("the government") may force the closing of one or more of the centers.

6. *Reluctance to settle away from the West Coast.* The West Coast represents the known, the rest of the country, the unknown. Rumors in the spring of 1943 about California being reopened added to the motives for just sitting until they can return to California, i.e., home. This general objection to relocation is in part rationalization as evidenced by the few Arizona people who have left Poston since the restricted area line was moved back sixty miles. Furthermore, a fear of strange lands has never been a real hindrance to migration, Japanese or otherwise, if the incentives were strong enough.

7. *Uncertainties of resettlement.* Nisei who might be willing to relocate and bring their families with them are uncertain about the draft. If Selective Service is reinstated, what would happen to parents, wives and children on the outside? Could they come back to the center? They are not sure and the War Relocation Authority policy has appeared to them to be uncertain on this point.

Aliens are uncertain as to their fate after the war and so are reluctant to try to relocate. Why undertake relocation with all its risks if one is going to be moved again in a year or so?

The W.R.A. policy appears to many evacuees to be unpredictable. "Once they said centers for the duration, now they say relocate. Next year they may say come back to the centers again." Recent agitation in California and elsewhere against relocation simply increases these fears.

8. *Insecurities in center life.* The constant new developments in W.R.A. center administration tend to add to the insecurities listed above. One example of this was a sudden move to "crack down" on employment conditions in centers whereby the old policy of giving project jobs to all who asked for them was replaced by drastic cuts in project staff "to encourage relocation."[8]

An even more unsettling recent event was the so-called segregation move, whereby thousands of evacuees were shifted between Tule Lake and the other nine centers. The supposed basis of segregation was past actions and answers to a loyalty question at registration. Actually many of the moves were made by individuals on the basis of family ties, worry about the status of Nisei in postwar America and other personal nonpolitical considerations. Much emotion surrounded the whole matter, especially where family splits were involved or where young Americans went to Tule Lake, the segregation center, out of respect to their parents. This created many of the early conditions of social disorganization in relocation centers and at Tule Lake led to strikes and violence reminiscent of early days at Manzanar.

9. *Citizenship worries.* There are a number of socially conscious individuals concerned with the problems of citizenship status. Is it more likely to be protected by relocating and dispersing or by remaining as a group in the center? This problem worries not only the Nisei who are directly concerned, but also the Issei on behalf of their children.

10. *Jobs offered.* There is a current attitude that the only jobs available are for domestic and unskilled labor. The formerly independent entrepreneur or farmer does not care to apply for such work. Many of the Nisei would really like to get into the war effort by working in war plants, but there is so much red tape involved, most of it applying especially to persons of Japanese ancestry, that few attain the goal of work in either war plants or civil service. This discourages others, and adds to the general conviction that American citizenship when held by persons of Oriental ancestry is not worth much.

11. *Organized opposition by pro-Japanese elements.* In some centers this may exist. If relocation is a United States Government program, then it is logical for the Japanese government to oppose it. There are reported radio broadcasts to this effect in one or two of the Western centers. Statements that the Japanese government will look after its own may be the work of a small group of actively subversive individuals in one or two of the centers. Such prop-

8. There is a tendency for project administrators to treat the residents of the centers as workers whose duty it is to work docilely for the management. They are surprised when dissension arises and tend to attribute the difficulty to "trouble makers."

aganda, however, could not be effective without the social conditions and attitudes already listed.

There is also a fear on the part of some of the individuals of adverse public opinion in their blocks if they relocate. This is similar to the public opinion controls that were in evidence at registration. On the whole, such adverse opinion is chiefly to the effect that one is foolish to relocate after all that has happened to the Japanese in this country since the war began. Better to sit it out and await the peace.

12. *Ignorance and rumor.* Many of the evacuee fears are increased by ignorance and rumor. Evacuees are often ignorant of W.R.A. policy and intention, partly because they have very little voice in that policy so it seems to them arbitrary and unpredictable.

Rumor plays its role in giving strength to many of the fears listed above. Some characteristic rumors of May 1943 were:

a. The only reason the government wants us to leave is to save money.
b. A number of Japanese-Americans were killed in Utah in reprisal for the execution of the Doolittle fliers.
c. Wages and working conditions seldom turn out to be as good as represented.
d. Nisei girls who relocate become prostitutes.
e. Housing is impossible to find and evacuees are often evicted from rooms or apartments.
f. The people of this center are going to be moved soon.

13. *Administrative attitudes.* The relocation centers are made up of interdependent and interacting social units. One cannot isolate the attitudes and activities of the evacuees from those of the W.R.A. appointed i.e., "Caucasian" personnel since they are interacting forces and the attitudes of the project personnel have their effects on those of the residents. The evacuees are very sensitive to prejudice, having been sensitized to it over the years and especially since evacuation. Attitudes of superiority and prejudice on the part of staff members sometimes hinder any real or open meeting of the minds between project administration and evacuee leadership, especially Issei leadership. This, of course, interferes with the need to get W.R.A. policies across to evacuee leaders in such a way that they can see their value and support them (or point out their faults and change them).

Fears of discrimination to be met with on the outside may be intensified by antagonistic attitudes met with in some project personnel and it is remarkable how a man's reputation for prejudice can spread even beyond his own project. Attitudes of social and racial prejudice breed an atmosphere of hate, suspicion and fear, an atmosphere not conducive to reducing feelings of insecurity or to creating respect for American democracy. They are attitudes which, if prevalent or existent in high places on the project, lead to resistances to administration either active or passive; they inevitably interfere with any constructive program of relocation.

To summarize, there are two chief conditions within the centers hindering relocation so far as the evacuees are concerned:

1. A deep feeling of insecurity exists in the average evacuee as a result of evacuation. He is afraid of discrimination; he is afraid of the high cost of living; he is afraid for his wife and children.
2. A new social organization is growing up within the center giving position and status to the individual. The evacuee as a member of this group is reluctant to leave the security it provides.

Taken together, these considerations make many evacuees, especially the Issei, reluctant to relocate. As to the Nisei who are more likely to move, they also are affected by feelings of insecurity and fears of loss of status.

APPLIED ANTHROPOLOGY IN LATIN AMERICA

DEVELOPING A PERMANENT AND STABLE SUPPLY OF NEEDED AGRICULTURAL MATERIALS

By

Charles P. Loomis, Associate Editor

At the time of Pearl Harbor those who were in the know realized that we were dangerously short of important agricultural products. Some agricultural products were of such immediate importance that failure to procure them might definitely condition the outcome of the war. These agricultural products and some others were called strategic materials. Most of the strategical agricultural materials of which we were short at the time of Pearl Harbor came from the East, and many of the original areas of production are now in the hands of the Japanese.

Among the most important strategic materials are rubber, cinchona bark from which quinine comes, certain rope and other fiber crops, special woods and various plants used in producing insecticides, especially rotenone. Most of these crops are grown in tropic or subtropic climates and many are native to the areas in Latin America in which these climates occur. Thus cinchona, the principal specific in the treatment of malarial fever, if native to the slopes of the Andes but about ninety per cent of the pre-war cinchona bark came from the Netherlands Indies and only ten per cent from British India and Latin America.

Derris, a plant from which the insecticide, rotenone, is produced, was supplied almost entirely from the East before the war. The same holds for pyrethrum, Japan being a major producer. Most lonchocarpus came from South America but none of these rotenone producing plants are now grown in sufficient quantities to supply current needs.

From the Philippine Islands came the rope fiber abaca, known as Manila hemp. Because of its wide use aboard and in anchoring ships, naval operations and shipping would have been hampered if United States Department of Agriculture officials and private companies had not begun production and experimentation in Latin America with this fiber crop before the war. As substitutes for abaca, sisal and henequen are now coming into their own. Before the war about two-thirds of these fibers came from Latin America and most of the remainder from the East Indies.

Among the materials not mentioned above, the United States Department of Agriculture is interested in medicinal plants such as ipecac, coca and sarsaparilla; beverages such as those from cacao, tea and cola; vegetable oils such as babassu, coconut, palm, tung, oiticica, cashew nut shell, castor and copra; essential oils produced from citronella and lemon grass; and various condiments, spices and flavors such as black pepper, ginger, nutmeg, mace and vanilla.

Everyone familiar with agriculture in the United States knows that most attempts to improve it have, until very recently, been channeled through the land grant colleges with their three basic approaches: experimentation, extension work, and resident teaching. Now that the Department of Agriculture is commissioned with the responsibility of assisting the various Latin American countries in developing dependable supplies of needed agricultural materials, it is only natural that these three approaches would be applied there. Experiment stations ordinarily precede other activities. They are usually organized in suitable areas under long-term cooperative agreements with the countries concerned, the United States Department of Agriculture furnishing part of the equipment and some of the professionals who are the experts in the various crops. (See map.) As planting stocks are developed, it is planned that extension services will be set up in connection with the stations. To train Latin-American professionals who may eventually displace the North Americans, the various Bureaus of the Department conduct training programs for carefully selected students.

Although all of the steps in the development of the program will be of interest to the applied anthropologist, it is the extension stage which most requires anthropological and sociological training. In this country most of the progressive Land Grant Colleges have extension rural sociologists attached to their staffs. It is the duty of these extension sociologists to help the extension agents, that is the County Agents, and the Home Demonstration Agents, with what is broadly called the "human" or "organization" problem. It is their role, as it is the special field of the rural sociologists proper (who do not do extension work) to study the culture of the area and develop the organizational structure within

LATIN AMERICA
MEXICO
Havana
Ciudad Trujillo
Martranc
Cozolapa
BRITISH HONDURAS
Tela
HONDURAS
GUATEMALA
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San Salvador
El Recreo
NICARAGUA
COSTA RICA
Turrialba
PANAMA
Turbo
VENEZUELA
BRITISH GUIANA
SURINAM (NETHERLANDS)
FRENCH GUIANA
Medellin
Bogota
COLOMBIA
BRAZIL
Pichilingue
ECUADOR
PERU
Iquitos
Oromina
Manaos
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PROJECTS
● EXISTING COOPERATIVE AGRICULTURAL EXPERIMENT STATIONS (PROPOSED COOPERATIVE AGRICULTURAL EXPERIMENT STATIONS - BOLIVIA AND COLOMBIA)
○ COLLABORATIVE AGRICULTURAL PROJECTS
• COOPERATIVE RUBBER PROJECTS
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which the extension agents and specialists work. It is obvious that agents cannot meet each farmer in a large prosperous farming county separately but he can meet them to put on demonstrations or for other purposes in various kinds of groups. Extension agents expect the extension sociologists to determine which groups they can most effectively work with and where necessary, to help organize such groups. It is often said that the extension sociologist must find or create the "handles" of the rural communities so that the extension agents can use them.

Already in several of the Latin American countries large planting stocks have been developed and the experiment station staffs are requesting that their stocks and the skills required to grow them be "extended" to the people. As the applied anthropological work of establishing these extension services proceeds it will be reported in this column or as special articles in the Journal. The author has just finished a field study which furnished the basis for establishing extension work at Tingo Maria, Peru. This study will be reported in a future issue. Studies of communities surrounding the other stations are projected and when made will also be reported on.

RURAL RECONSTRUCTION IN MEXICO

Self-Help Method for All-Round Rural Development

By
D. Spencer Hatch

This is a brief description, written by request,[1] of developments the first year and a half in Camohmila Center and Extension.

The Demonstration Center has eleven acres, three-quarters of a mile beyond the end of the road where tourists stop at Tepoztlán. From the end of the road we come on down the bridle path which forks at the far corner of our Center and leads to villages in two sets of valleys. No wheels turn in these villages, eleven in number. We ride to and from them as the people do, on horses or mules. These villages for which Tepoztlán is a natural center are real Mexican villages, untouched by city or by any other outside influences. We are glad we are thus beyond the end of the road where outside influences do not play, for here as in a test tube in a laboratory, we can measure results of methods tried.

Another good fortune in our situation is that this set of valleys, like all Mexico, is on a slant. The problem of Mexico is not a horizontal one. The highest of our villages is 3500 feet higher than the lowest. The highest is cool, temperate in climate; the lowest almost tropical, so if we find, in this range, crops, fruits and annuals good for these different villages, they will be good for a very large part of all Mexico. In each somewhat parallel valley there is the expanse of cultivatable land and a village. The hills separating the villages are rocky, grand, and extremely picturesque. This is the rugged country where Emiliano Zapata led the people of these villages during the revolution in their fight for possession of their land. The fact that the people did get the land and now hold full right to it is a basic reason why our self-help rural reconstruction can be a success. Zapata is the great hero of all our people in these villages.

The Same Basic Needs

A preliminary survey showed that the people here have the same basic backwardness, the same kinds of troubles, the same needs as in British India villages, on the other side of the world, where we had studied and worked for twenty years: land insufficient and needing building up, no variety of crops or fruits, no rotation of crops, pests for nearly every plant and tree, all livestock and poultry needing improvement, bad housing, no system of sanitation, scarcity of water even for drinking, schooling very inadequate, no recreation or good times for young or old (except one miserable *fiesta* a year in each village).

We first tackled our land. Dr. Charles F. Kellogg, Chief of the Division of Soil Survey, Washington, D. C., visiting us, said of our soil: "Technically, it is almost perfect." An expert of the Morelos State Government Agricultural Department said: "It lacks everything," meaning all necessary elements

1. Editor's note: This note was solicited by the Associate Editor of Applied Anthropology in Latin America after he had visited the project in July of this year.

had been taken out by long abuse, including single cropping of corn. Analysis by Engineer Miguel Brambila, of the Mexican Government, reads as follows:

"*Sample 1.* Subsoil is medium, first, because of its clayish texture which would probably make it unsuitable for plowing, and second, because of the lack of fertilizing elements and bacteriological flora, which will tend to make it almost non-productive.

To improve it, use Manganese Sulphate, in the proportion of 50 kilos per hectare, also lime Superphosphate, 300 kilos per hectare. Plant clover or soy bean for plowing under.

"*Sample 2.* Much better quality. Texture very good; fertilization adequate and does not contain any large percentage of harmful alkaline salts. Rather deficient in manganese and in bacteriological flora. Use Manganese Sulphate as recommended above, sow leguminous plants, periodically, and plow under."

To replace the humus, we began at once, energetically, to make compost from all available weeds and waste, according to the ten simple rules I had used in India. They are as follows:[2]

1. On any level bit of ground, the area of which will vary in size according to the amount of material available, lay out a space, say, 16' long and 8' wide at the outside. If more material, make several such spaces.

2. Spread, until 9" deep, green material, weeds, human waste, hen manure, sacking, newspapers, refuse, anything and everything.

3. Put on a sprinkling urine earth (made by bedding cows or other animals with earth) and ashes.

4. Put on a layer of fresh cow-dung about 2"-3" thick. Even if no cow-dung or urine earth is available, compost can be made provided more than one-third of the residues is soft and of fine texture such as fallen leaves, legume crops harvested green, green grass and weeds. The addition of ordinary soil is necessary, and wood ashes, or lime if the soil is deficient in lime.

5. Water thoroughly.

The process thus far constitutes one layer. By the addition of the manure, earth and ashes the mass is 'charged' so that the bacteria will start multiplying and working.

6. Repeat layers until 3' high.

7. Fifteen days after charging, turn and water thoroughly, putting one-half of the heap on top of the other half. The heap will now be only 3' high owing to decomposition and settling.

8. Fifteen days later, thirty days from starting, again turn the whole and water.

9. Thirty days later, sixty days from starting, turn the whole a third time, and water.

10. Thirty days later, ninety days from starting, the compost is ready for use.

Also, I experimented with various plants and legumes for plowing under as green manure. From this test, the cow pea did better than the soy bean for our condition. It made very luxuriant widespread growth, giving more material for humus, and also had more nitrogen modules on the roots. Rye, also absolutely new here, grew as tall and as well as on the hills of New York State, where my father astonished the natives by making clover grow on bare sandy knolls after he had plowed under rye. Rye was about the only crop that would grow on those knolls. I consider it a good crop here for plowing under; also Sudan grass which grows profusely during the rains, but I am specializing this year on the cow pea for this purpose. We used a quantity of cow manure which boys picked up for us mostly out of the roads where it was being wasted.

Toward Needed Variety

We tried out seventy kinds of field crops and vegetables, each in a very small way, with the purpose of finding some new crops suitable to the area where there was not much but corn. There is such a need for variety and balance in food. Even beans, so dear to the Mexican stomach, had been driven out by the Mexican bean beetle. This pest promptly attacked all our nine kinds of beans, except the two kinds of sojas, which stood among the others untouched. We were able to manage the bean beetle with sodium arsenate sprayed on with a thirty-cent hand pump, after the vines had been wet with a flit gun. Of the plants tried, the following may be said to have shown good promise: rye, oats, buckwheat, Sudan grass, sorghum, field beans, edible soy beans, soy bean for fertilizer, cow pea, green and yellow, string beans, carrots, radish, turnips, kohl rabi, lettuce, cabbage, sweet corn, sweet potato, mammoth Russian sun flower, peanuts, castor beans. We are trying most of the above again this year. Other plants deserve further trials. Some of them did

2. Hatch, D. Spencer, *Further Upward in Rural India*, Oxford University Press. Press. pp. 121-22.

badly because of very poor seed, some from pests we have not yet found the remedy for. We had to depend on the natural rainfall, and we found that some of the plants which did not do well in the rains did well in the dry season, if they could be given water. We have a feeling that in our range of climate an unusually wide variety of vegetables and fruits can be successful when we find the right varieties, seasons and cultures, also pest remedies.

We have described in our News Sheet, under the title of "Insomnia" our successful conquest of the ant which through the centuries has been destroying trees, whole fields of corn and other plants in these villages: "The rains came; the corn seeds sprouted and grew one inch, two inches; and the ants came and ate. Laboriously, the villagers began to gather sleeping potions, the wild *yo-yo* plant and the wilder *waiamatl* plant. Temptingly, they placed piles of the shredded leaves at each ant-cave front door. And the ants slept. Only some, too many, suffered from insomnia, and the midnight raids ravaged the corn and the bean fields. Grown men helpless before tiny ants! 'Senor, you have a gun, you puff-puff into the hole and all the ants sleep and your corn grows tall and strong.' Cyanide gas in a blow gun replaces, during the rainy season, the feast of Paris green as ant exterminator and plant and tree saver at Camohmila. The villagers are amazed and delighted with this new help."

Twenty-one varieties of trees were planted as a trial. Here again the only fruit that grew unspoiled by pests was the "*ciruela*", which has a large stone and looks like a plum. This is the villagers' best money crop. The mango has worms, the avocada two pests which prevents it bearing after the first time. The banana, because of wrong variety and culture, is only an ornamental plant. The peach is small, selling for eight cents a hundred. Yet, we feel fruit culture is a wonderful possibility for these valleys. This opinion is shared by Governor Jesus Lopez Castillo of our State, who backs his belief by helping this part of the program with funds.

Toward improving the animals and poultry, we have started with a few young individuals of Poland China pigs, Gabardine Milch goats, Jersey and Holstein bulls, Merino sheep, Barred Plymouth Rock and White Leghorn fowls and Pekin ducks. We do not intend to keep a large number, but to use a few for experimentation and as a reservoir for breeding up the stock in the villages, largely through distribution and circulation of males.

For these animals and poultry we built small model structures with the idea of them being copied. Before our first small poultry house was finished, I was asked by a villager to come help him with his attempt to put bees into modern hives, which he had made like ours. As I went into his backyard I was surprised to find he had already copied our poultry house, making his twice as big as ours. He had ingeniously put in a wild bamboo front firmly set in mud, instead of chicken wire (scarce and expensive in wartime). This front attracted the attention of the forty delegates from the Inter-American Conference on Agriculture, who visited us. They thought it excellent. Thus, you see, we copy the villager. In this poultry house, Trinidad Torres put a concrete floor like ours had. When asked why he didn't put a floor in his house first, he said, "No, I'll take care of my hens well. When they lay eggs, then I'll put a floor in my house." He has since done this in connection with the movement for better housing, which has started quicker than we expected.

Better Housing

When we built "Yancuic Cali" (New House) as the villagers named it from their Nahuatl language which they still love, outsiders said: "This will probably be the last of your demonstrations to be copied; very conservative about houses, and anyway a family doesn't build a house oftener than once in fifty years." We built the little house on the far corner of our land where the bridle path branches to go to two series of distant villages. It is of adobe, not much more costly than the houses they always built, but whitewashed, has a floor, windows, place for making *tortillas* raised up from the floor, a forty-three cent shower bath, beds of loose, springy boards on "horses" (burros, as they are called here) which can be taken apart and put out in the sun. On the beds are corn husk mattresses - the husks put between the usual *petate* mats - so much warmer. Beds have patchwork quilt covers made in the house. The house has the first stove pipes of the region to direct the smoke out instead of into the women's eyes. Around the house is the lawn, garden, fruit trees and poultry house, with double yard to insure green food at all times. To this house, one cold night Juan Argueta came to live with his wife Tomasa, Enrique, five, Carlos, four, and Celerina, two, typical village family. They came out of a one-room hovel. Carlos carried their one blanket. He climbed up onto the husk mattress, shivering partly from cold, the rest from exuberant excitement, but

happy. His house, his bed! Since that, a baby, Fernando, has been born.

Many visitors stopped in: a young woman teacher recently married said she had a piece of land in Tepoztlan and such a house would just suit her and her husband. They started building. We were told that girls in Ixcatepec village were saying to the boys: "We won't marry any boy who won't make us a model house." Melquiades, who had worked as a *peon*, building *Yancuic Cali*, married and soon began making adobes for his house, on a beautiful site overlooking the brook. He has built the house with only the help of another boy. The leader of Excatepec began to reconstruct his house of one room and kitchen which had housed a family of eleven. "I'll make it as bright and attractive as *Yancuic Cali*," he said. He made more rooms, including bathroom and dining room, put in sufficient windows and doors, concrete floors and color-washed the whole. So began the movement for better housing.

Propaganda Unnecessary

The bore-hole latrine with the little shelter of thatch at *Yancuic Cali* stood as one of our silent demonstrations for healthier living. The nearest village soon made plans for latrines in homesteads and for the new school which had been built with the cooperation of the people of our Y.M.C.A., the Center, and the Government.

It is the quick response of the people that makes the teaching effective. There is no need for propaganda. If we at our own Center or for any of the villagers who ask, do anything good and suitable to the area, the people do plenty of looking and thinking. They are capable of deciding what they want. When they decide, they want it quickly and bring money to pay. They are not beggars; another significant trait of character. Another quality I appreciate is a healthy stubbornness. They will be induced to do nothing they don't want to or don't believe in. This protects them from being led by the unwise and unfriendly; protects them from selling their land which they have fought for and got at such cost. Show them money for many times the value of a piece of land, a donkey or a duck, it tempts not a bit if they had decided not to sell.

The women fully equal the men in quick responses. In November when we inaugurated our Center, we exhibited a few samples of patch work quilts and wool sweaters, which the Excatepec village teacher and Mrs. Hatch had taught the first girls to knit. Many visiting women and girls saw the exhibit. Immediately more wanted to learn to knit. There are 89 now in our knitting class. The girls knitted first for their families who much needed warm clothing, but soon some became proficient and ready to sell their sweaters. An order for two-hundred, in bright shades of brown, green, blue and gray, was received. These, contrary to the expectation of even the buyer, were ready long before the date set.

Cure for So-Called Laziness

We do not find these people lazy when they have work which they believe in and which is for their benefit or in which they have a partnership interest. Some business men say they have been trying for many years to make these Indians work and found them the "laziest people on the face of the earth." I believe we find a fundamental psychological difference between working for themselves, and working for the business interests of an employer. We are teaching them, helping them to help themselves.

Men, women and children work long hours with their hands and almost no equipment in their fields. They have little fun, go to bed without lighting any lights, and back to the fields early in the morning. They have one poor festival in each village once a year. We have started our social program with a "*fiestecita*" from five to seven every Friday evening at our Center. Boys and girls, men and women meet in our exhibition building or outside for songs, games and dancing. They come just for a good time. We expect to enlarge greatly this social program. With such sports as the "charro" activities, caring for, riding, lassoing horses will be coordinated teaching the care of all animals. This appeals forcefully to all Mexican village boys and girls. The *fiesta* is necessary to Mexican hearts. Bullfighting, cockfighting and drinking in the villages can be replaced, we think, by *fiestas* on a higher plane.

The Spiritual Basis

The work here, althoug' so new, is shaping itself in the five departments to answer the five divisions of needs: spiritual, mental, physical, social and economic.

The spiritual basis is the foundation for all we do on the other sides. We doubt the lasting and multiplying possibilities of things done, even though beneficial, on a purely material basis. We would live and do here as near as we can as Jesus did when he went among all the villages helping the people upward from all their troubles. This is done without verbal preaching or any mention of denom-

inations. These spiritually-minded people say that as they understand Christianity, this serving together is it. They say they like the idea - that we are all joining together to live and accomplish better - to bring their villages upward to be a truer part of the Kingdom of God.

REVIEWS OF THE LITERATURE

Objective Studies of the Social Behavior of Animals

By

Charles F. Harding, III, Associate Editor

The purpose of this paper is to review that portion of the literature on animal sociology which should be of interest to those engaged in working out observational and objective techniques for describing human social relations. Human beings are, after all, animals and therefore it ought to seem neither strange nor shocking should it appear that techniques developed in the study of animal sociology and generalizations resulting from the use of such techniques may have a direct use in the study of human societies.

The students of animal social behavior have been more fortunate than the students of human social behavior in that they have not had to deal with verbal effusions of their subjects. Because the referents of the words used by human subjects are so often unavailable to the student, being concealed in the personal and emotional past of the individual subjects and also because of referents in the student's own life to such words which he cannot escape, the interpretation of such verbal material often becomes difficult if not impossible. This is true where the student endeavors to track the referents of the subject's words into the life of the subject. How much more impossible the situation becomes when, as is often the case, the student makes no such attempt, but rather interprets his subject's statements in terms of some elaborate preconceived intellectual scheme. The student of animal behavior being unable to interview his subjects has been forced to rely to a greater extent on the actual observation of behavior. Even here in many cases, however, an all too human urge toward anthropormorphism has prevented the attainment of a complete objectivity.

That lawful behavior of the overt actions of living organisms can be demonstrated through operational description is evidenced by the work of Jacques Loeb, W. J. Crozier and others. For example, Crozier has shown that a slug, limax, with one eye removed is caused to turn by light, the degree of turning being directly related to the intensity of the light, if the illumination is kept constant and the temperature changed. A precise relationship between angle of turning and the temperature was shown. Young rats placed on an inclined plane were shown to creep up the inclinations at an angle related to the angle of inclination. When the inclination of the plane was kept constant and the temperature changed, the angle of creeping changed lawfully with the change in temperature. Thus, from this brief summary of a small portion of Crozier's work it will be seen as we have said that the overt behavior of living organisms can be shown to be lawful. There is no better introduction to the operational study of behavior than Crozier and Hoagland's *The Study of Living Organisms* (1934). Since such studies do not deal with social behavior, we can give them no further space here, but students of social behavior could not have a better introduction to the point of view and methods of the quantitative study of overt behavior. That such methods will produce results in the field of social behavior has been demonstrated by Chapple (1940).

Before going on to the work done on the social behavior of animals, let us first examine those aspects of individual behavior which have a bearing on social behavior. Certain overt behaviors are exhibited by living organisms which do not seem to be in response to external factors but seem to result from changes within the organism.

Stier, in working with young mice, before the development of their temperature-regulating mechanisms, found that, when conditions (extraneous excitations) were kept constant the mice still exhibited activity. This activity was not random in its

occurrence, but occurred in bursts separated by periods of quiescence. With an increase in temperature, the bursts of activity increased in frequency. When average frequencies of activity periods for different temperatures were plotted according to the Arrhenius equation, the value of the temperature characteristic was found to be 25,300 calories. Durations of the periods of activity and quiescence also changed as a function of temperature. When their reciprocals were plotted according to the Arrhenius equation a temperature characteristic of 13,200 calories was obtained for activity periods and 30,900 for quiescence. (Stier 1930, 1933, Crozier and Hoagland 1934, Hoagland 1935.) Stier suggests that these facts may be explained by the rhythmical or periodic discharge in doses of a certain magnitude of some substance from a central organ, the frequency of the discharge being determined by the velocity by which the underlying process causes the substance to accumulate in the place from which it is discharged. Variation from the assumed basic cycle seems to occur in multiples of 15 minutes for activity and in jumps of 24 minutes for periods of quiescence. Stier suggests that this "spontaneous activity" may be controlled by the gastro-intestinal tract, as movements of the empty stomach are associated with bodily activity. (Stier 1930, 1933.) Patterson has investigated the rhythmic activity of the digestive tract and its chemical pacemaker control. (Patterson 1933.)

Skinner has also studied spontaneous activity but from a different point of view. In his experiments a rat was placed on a wheel which turned as the rat ran. Here too, extraneous excitations were eliminated and the record as shown on a continuous distance-time graph showed alternating periods of activity and quiescence. If activity was prohibited for some part of the day, the remainder of the day showed a greater concentration of activity periods which, if the period during which activity was prohibited was long enough, assumed continuous properties. The spontaneous activity shown in these experiments was quantifiable and predictable throughout. (Skinner 1933, Crozier and Hoagland 1934.)

The experiments of Richter (1922) tend to confirm the results of Skinner and Stier. He found a periodic occurrence of activity in isolated rats which he attributes to gastro-intestinal changes. The number of periods per day seemed gradually to decrease as the rats grew older, and as they grew older there seemed to be a progressive tendency toward increased nocturnal activity. Here perhaps light, or rather its absence, became a condition of increased activity as the rats grew older. Wolf (1930) suggests that the periodic activity of Japanese dancing mice, which shows a diurnal rhythm, depends on light stimulation. Welsh (1938) presents a considerable body of evidence for diurnal rhythms in many animals. Such rhythmic activity cannot be described as "spontaneous" according to our definition above as it occurs as a result of stimuli external to the organism.

The internal rhythm of the oestrous cycle in female animals, however, does seem to produce changes in overt activity that might, according to our definition, be described as "spontaneous". Among birds periodic migration has been shown to be initiated by changes in the gonads. (Rowan, 1931.) Wang (1923) discovered that in the absence of males, female rats on a tread wheel showed regular activity cycles of about four days in length, approximately the same periodicity as the oestrous cycle. These activity cycles were absent before sexual maturity, during pregnancy and lactation, and after mechanical stimulation of the cervix uteri, or ovarectomy. The physiological changes of the oestrous cycle regularly produced changes in the four-day rhythm activity, as shown from the tread wheel records, being at its height during that part of the oestrous cycle in which the female rats were most receptive.

Slonaker has verified Wang's conclusions. He also found that the male rat showed no similar "spontaneous rhythm" unless confined in cages close to those of active females. (Slonaker 1924, 1925.) Kinder showed that nest building activities in mature female rats fluctuated with the oestrous cycle. In immature rats it was demonstrated that changes in temperature controlled the nest building activity and Kinder points out that in mature rats nest building activity was greatest when there was greatest need for heat conservation as during lactation or the phases of "spontaneous activity" in which activity was at its lowest ebb. Sturman-Hulbe and Store (1929) confirm these results. Zuckerman (1932 Ch. viii) summarizes much of the literature on the oestrus cycle and behavior in mammals and also considers the effect of the menstrual cycle in primates on behavior (1932 Ch. ix); here, however, the changes in behavior described are largely social and as such will be considered later.

There are some indications that activity changes follow changes in the menstrual cycle in human beings. Readers of the review of some of the literature on industrial relations in a recent *Applied Anthropology* will recall that during the period of

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menstruation the output of women workers in the Relay Assembly Room fell off slightly. The work of Eagleson (1927), however, would seem to indicate that loss of efficiency comes in the period immediately before menstruation and that efficiency increased during the period. These conclusions are based on scores in hand-eye coordination tests, and tests of adding ability. The work of Benedek and Rubinstein (1939 a & b) is also suggestive, though hardly objective.

Before proceeding to the discussion of social manifestations, let us summarize the material already examined. Overt behaviors of animals can be shown to vary lawfully with changes in conditions. The apparently random spontaneous activity of isolated animals, conditions being held constant, occur periodically and lawfully and have as their basis recognizable physiological changes within the organisms. It is clear then, that the activity of individual organisms when objectively described can be shown to be lawful, and to vary lawfully in accordance with internal or external changes. Thus we may be led to suspect that an objective, operational description of social behavior, of the activities of animals as they stimulate and respond to each other, would demonstrate that the behavior of animals in a social situation will vary lawfully with changes in the social situation and within the animals, other conditions being constant. Such a suspicion is re-enforced by the observation that male rats, when confined near female rats, exhibit the periodic activity changes occurring in the female rats and produced in them by oestrous changes. The following summary of the work done in animal sociology will not completely bear out what we have been led to suspect should be the case were animal social behavior operationally and objectively described. This, I believe, is because such descriptions in this field are not completely objective or operational. The sort of conclusion drawn from the above described work on the behavior of isolated animals is one of a functional relationship, functional in the mathematical sense. Such conclusions cannot be reached without quantitative data and a controlled situation in which one condition can be varied while the rest are held constant. Much of the work in animal social behavior, however, is based on discriminations which are, or could easily be made, fairly objective. The result is that the more objective the studies of animal social behavior are, the more strongly they suggest the conclusions we have deduced from the work on the behavior of isolated animals.

The mere presence of animals in proximity to each other can be shown to promote conditions having marked effects on the individual organisms involved. Up to a point the more individuals of a certain species of animal occupy a given space, the longer they can survive certain lethal conditions, or more readily recover from lethal conditions to which they have been separately exposed. If the number of animals in the given space is increased beyond an optimum number the effect of the lethal conditions becomes more pronounced. A number of experiments with various types of organisms resulting in the above conditions are described by Allee (1931, 1932, 1935, 1938), who gives the name "aggregation" to such groups of animals associated together in a fairly small space. The chemical processes at the basis of the phenomena observed in these aggregations are described in many cases.

Another phenomenon induced by the presence of more than one animal in a given space may be described as "facilitation". Thus, among protozoa, crustacea (Daphnia), insects (Drosophila) and among birds, the rate of reproduction is increased by the presence of more than one couple. The sudden decrease and final disappearance of the heath hen has been attributed to the fact that the flocks were killed off to a point where the reduced number no longer provided the necessary social stimulus for reproduction. (Allee 1931, 1932, 1935, 1938, Crawford 1939.) Chen counted the number of pellets of earth moved by isolated ants within a given time and so determined the rate of work for each of a number of them. The ants were then grouped in twos and threes and the number of pellets removed counted. Ants which worked at a medium rate were slowed down by association with slower workers, speeded up by association with faster workers. The number of pellets moved per ant was greater when ants were grouped than when they worked alone, but this social facilitation was at a maximum when two ants were working together. Additional ants did not further increase the output per ant. (Chen 1938 a & b, Allee 1938.) Learning experiments demonstrated that cockroaches and goldfish learned more rapidly when trained in twos and threes, whereas parrakeets learned more rapidly when trained alone. (Allee and Masure 1936, Gates and Allee 1933, Allee 1933, 1938, Welty 1934.) Rats learned as well alone as when paired. (Waters 1937.) The increased rapidity of learning for goldfish when grouped may be explained in part by the fact that when goldfish are observed in groups of one, four, eight and sixteen, it appears

that the amount of overt activity is related to the size of the group. (Welty 1934.)

Social facilitation of feeding was demonstrated for rats by Harlow (1933). Thirty-four young rats were separated from their parent at weaning, eighteen days after birth, and kept isolated for thirty days. They were then fed alternately singly and paired for twenty days. Eight per cent more food was eaten under social stimulus. This percentage did not change materially from beginning to end of the experimental period. The facilitation was no greater for groups of three than pairs. When one animal of the pair did not feed, the other animal ate no more food than when alone. The feeding of rhesus monkeys socially stimulated was shown by Harlow and Yudin (1933). The degree of facilitation seemed to depend somewhat upon whether the paired animals had access to each other's food or not, facilitation tending to be greater where there was such access. Lepley (1937) and Bruce (1937) found that the running of rats along an alley toward food or water goals was socially facilitated. (See also Crawford 1939 for a summary of social facilitation in vertebrates.) The experiments designed to test for social facilitation in animals, the results of which are described above, simply contrast a social situation with a non-social situation. It may very well be, however, that some social situations will facilitate whereas others will not. The amount of social facilitation may depend on the dominance-subordination situation among animals tested, which in turn may be altered by the oestrous cycle of females as we shall see later on. Those who have read in a recent *Applied Anthropology* the review of the reports of the experiments conducted in the Hawthorne plant of the General Electric Company, will recall that the social situation in the Relay Assembly Room was such that output increased steadily over periods regardless of certain experimental changes made in certain working conditions, whereas in the Bank Wiring Room output seemed to be held at a fixed level, the difference in output records of the two rooms being attributed to the nature of the social situation in each.

We have now discussed some of the phenomena resulting from the association of animals in groups, first, increased chances for survival of animals in aggregations in numbers up to a certain optimum, and the decrease of such chances with a further increase in numbers, secondly, facilitation, and in some cases, inhibition, of reproduction, work output, bodily activity and so on. These are things that happen when animals are associated together. Let us see if we can discover any information as to why they do associate together. To some extent this is already explained once we have discovered the effects of associations. The hibernation together of large numbers of snakes in "dens" may be explained by the survival value for the individual of being part of an aggregation. The earlier writers, as for example Alverdez, did not deal with experimental data but with reports on the behavior of animals in their natural habitats. Alverdez (1927, 1935) recognizes the following types of animal associations: 1) promiscuity, 2) monogamous solitary seasonal mateship, 3) monogamous solitary permanent mateship, 4) monogamous solitary seasonal mateship within herds, 5) monogamous permanent mateship within herds, 6) polygamous solitary seasonal mateship, 7) polygamous solitary permanent mateship, 8) polygamous seasonal mateship within herds, 9) polygamous permanent mateship within herds, 10) closed herds (outsiders driven away), 11) open herds (outsiders taken into the herd). Many examples of these various types of association are given. Permanent mateship is attributed to the possibility of more or less continuous sexual activity between the mates throughout the year, whereas seasonal mateship is attributed to the limiting of sexual activity to a period of "heat" or "rut". It has been suggested that the human family derives its more or less permanent character from the fact that sexual activity is possible throughout the year and the helplessness of infants and their mother for a fairly long period of time. These characteristics are also the case among most of the primates. (Zuckerman 1933.) Herding and other forms of asexual behavior cannot, however, be explained by the sexual physiology characteristic of a species. The observations upon which Alverdez bases his conclusions are not the careful detailed observations of specific interacting individual animals such as are sometimes obtained in the laboratory and such as are now being made in the field by a few trained observers, but are the casual observations of travellers and wandering naturalists. As a result only the broadest generalizations were possible for him.

Work similar to that of Alverdez for animals in general has been done by Friedman (1935) for birds. The investigations of insect societies (Wheeler 1913, 1923, 1928, Buckingham 1911, Schneirla 1934, 1938, 1940) have done the same sort of work. It is difficult to abstract any objective generalizations from such work other than that some animals associate together in large groups, others do not. Some mate seasonally, others permanently,

depending perhaps on the presence or absence of seasonal sexual activity. Those who have written on the social life of insects describe a specialization in body structure with corresponding division of labor, such as the division of some ant societies into workers, soldiers, queens, males. Here one of the specialized classes could not survive without the others, necessitating a society. Similar specialization is not found among any of the vertebrates, however, except such as may depend on sex or age.

Most of these writers postulate a social "instinct" which binds the social group together. Animals used to society and possessing such an "instinct" have been observed to behave in an abnormal manner when isolated. (Alverdez 1927, Crawford 1939.) Alverdez suggests that the sense of smell or the sense of vision serve to bind the group together. This is better than hypothesizing an instinct to "explain" the grouping of animals. At least it can be tested. Parr (Parr 1927, Allee 1938, Crawford 1939), offered a theory along the lines of Alverdez's suggestion to explain schooling in fishes. He postulated a positive attraction between individuals which brings them into a certain range of each other at which point occurs a repellent stimulus condition arising from sensations produced by too close visual accommodations. The balance of stimuli of fish on either side keeps the fish on a straight course, while the fish on the outside tend to be positively attracted only toward the center of the group, all the other fish being on one side of them. This theory is substantiated by the fact that blinded fish do not school. More recently Parr (1931) has indicated that behavior under a sexual stimulus in fishes produces reactions somewhat opposed to schooling tendencies. Parr's work has been substantiated by the work of others. Bowen (1931, 1932) has shown that among catfish vision is a primary factor in schooling, blinded fishes acting upon tactual and vibratory stimulation to a more limited extent. Langlois (1936) found that bass oriented themselves in relation to each other by visual stimulation. Breder (1929) demonstrated that certain fish would not approach a solid object nearer than a particular point, Spooner (1927) that bass were mutually attracted toward each other though separated by a glass partition and that single bass were attracted toward their own image in a mirror. Breder and Nigrelli (1935) after studying the effects of temperature, intensity of light, and chemical composition of water on the schooling of fish, concluded that the primary factor in schooling was visual stimulus and agreed with Parr that schooling was inhibited by sexual stimuli. Nobel and Clausen (1936) have obtained similar results from reptiles. Social insects such as ants and bees seem to orient themselves in relation to each other largely by sense of smell (Alverdez 1927, Wheeler 1913, 1923, 1928, Schneirla 1934, 1938, 1940).

It is interesting that grouping occurs not only in many celled animals but also among the protozoa. Even such simple animals have a "social life". This "social life" is not a random affair but follows certain rules. Paramecia can be observed clinging together, moving about in masses, or chains or pairs. Upon close study it is revealed that certain paramecia will cling together whereas others avoid each other. This joining together has been called "mating" as it appears that after reproducing by fission for a period, paramecia cling together, interchange chromosomes, after which they again start to reproduce by fission. Observation has revealed that paramecia may be divided into three groups. Members of one of these groups will not "mate" with members of the other groups. These groups are divided into subgroups, two of the groups into four subgroups, one into eight. Members of these subgroups "mate" with members of the other subgroups within their group, but not with members of their own subgroup. After "mating" paramecia tend to avoid all other paramecia for several generations. Then gradually the "mating" tendency appears again. The "offspring" of a pair or "mated" paramecia may belong to the subgroups of either of their "parents". "Mating" behavior shows a diurnal rhythm. There is no "mating" at night, before 9 a.m. or after 5 p.m. It has been suggested that "mating" preference and avoidance may be determined by some sort of chemical sensitivity. (Jennings 1941.)

Having discussed the grouping of animals and some of the effects of such grouping on the animals of the group, it is now time to consider the social structure of the group. Among almost all vertebrates, groups of animals are organized into hierarchies. The hierarchical organization of animal societies was first specifically described by the Norwegian scientist Schjelderup-Ebbe. He noticed that in a flock of hens one hen pecked all the others but was not pecked by these others, another was pecked by the first hen but pecked all the rest and was not pecked by them, and so on down until the last hen was pecked by all the others and did not peck any of them. This situation has been represented diagramatically by Allee (1942) as follows:

Individual	No. pecked	Individuals pecked
BB	8	RG RR GG BR YY BY GY RW
RW	7	RG RR GG BR YY BY GY
GY	6	RG RR GG BR YY BY
BY	5	RG RR GG BR YY
YY	4	RG RR GG BR
BR	3	RG RR GG
GG	2	RG RR
RR	1	RG
RG	0	

In a flock of cockrels the same sort of organization occurred though in a less clear-cut form. Among cockrels one might be subordinate in the hierarchy to one but dominant to another, which in turn dominated the one to which he was subordinate i.e. A pecked B who pecked C who pecked A. Schjelderup-Ebbe noticed that the bird which was dominant over only a few others was more strict a despot than one which was dominant over many. The birds low down in the hierarchy were dirty and bedraggled. (Schjelderup-Ebbe 1937, Allee 1938, 1942, Crawford 1939, for a more complete bibliography of Schjelderup-Ebbe's works see Crawford 1939.)

Hierarchical dominance and subordination have also been observed in other birds. These observations would seem to indicate that dominance is not always as strict as that described for hens. Among shell-parrakeets and pigeons, hierarchies have been worked out. Here all birds pecked each other at one time or another but some pecked others much more frequently than they were pecked by them, the hierarchical relationship being determined by a ratio of times pecking to times pecked for each pair. (Masure and Allee 1934 a & b, Allee 1938.)

Murchison, working with chickens, in a series of papers attempted to relate dominance, determined by allowing all pairs to fight to a conclusive finish, with three other tests designed to reveal objective aspects of social behavior. (Murchison 1935 a, b, c, d, e and Murchison, Pomerat and Zarrow 1935.) The first test consisted of introducing a chicken at either end of a board and allowing them to run toward each other, the relative distance each ran being observed, the second, of determining the frequency of treading of hens by the cocks, and the third, the discriminative differential approach of the chicken being tested toward two caged stimulus animals. The data obtained from these experiments was subjected to considerable mathematical manipulation which hardly seems warranted as the number of observations was not great and the linear functions claimed as relationships between the various responses were based on very few points. This reviewer suggests also that perhaps the various tests did not in reality show different responses but rather described what was a basic response in terms of different operations. We will return to this matter later on.

Uhrich (1938) worked out dominance-subordination hierarchies for a large number of albino mice in groups of from three to nine. Using fighting as a method of determining dominance he distinguished six types of organization: 1) exclusive dominance, which was most common and in which one mouse dominated all the others who maintained an equal position; 2) exclusive dominance, but with some resistance; 3) linear dominance in which one dominated all, the next all but the most dominant, the next all but the two above him, as among hens; 4) linear dominance with resistance; 5) equal dominance, in which two mice dominated all others, the two dominants in some cases fighting each other, in some cases not; 6) unsettled dominance; 7) no fighting, and so according to Uhrich's criteria, no dominance situation at all. It may very well be that in the last case the hierarchy had become so established that the subordinate mice were conditioned to such a degree that fighting was no longer necessary to maintain a hierarchy which might have been worked out by use of other criteria. This is substantiated by the observation that among newly grouped mice who were strangers to each other, there was a greater amount of fighting. On the whole, Uhrich found hierarchical organization among mice was very unstable and subject to frequent change.

Winslow (1938) observed a hierarchical organization among cats which would correspond to Uhrich's first type, one cat dominating all others who were on an equal basis with regard to each other. The dominant animal mounted all others regardless of sex. Upon his removal there followed a few days of indeterminate relationships until the next most aggressive male established his dominance.

Zuckerman (1932) was among the first to notice the importance of dominance-subordination relationships in a primate group. From his observations of a captive colony of hamadryas baboons he found the dominant male got most food, and had access to most females from which he kept other males. Females responded to him by presenting themselves for mounting. The females of the dominant male's harem established a hierarchy of their own among themselves, the most aggressive and

willing to fight being dominant. Bachelor males fought among each other and attempted to establish a dominant relation over each other and females, if they could avoid the dominant male. The dominant male might be ousted from his position by losing a fight to another male. In such an event he avoided all other males and was treated by them in an increasingly aggressive manner. Zuckerman's description of the history of his baboon colony is very detailed but hardly systematic, which makes generalization difficult. Gillman (1939) observed a somewhat similar situation among Chacma baboons. He also found the dominant male got most food and dominated females. Female Chacma baboons also had an established hierarchy among themselves.

Carpenter (1937) reporting on observations of two young mountain gorillas noted that one was dominant in food situations while the other was dominant in play. From his observation of gibbons, Carpenter (1940) he concluded that dominance played an important part in gibbon social structure and noted in individuals a wide range in variation in dominance. Here too, one animal might be most dominant in food situations and another in play or sexual situations. Among howling monkeys, Carpenter (1934) noticed little in the way of dominance-subordination relationships except that adult males in general controlled and coordinated the group activities. Among red spider monkeys both adult males and adult females seemed to take part in controlling the group (Carpenter 1935). The mere fact that a particular animal is at the front of a moving group does not necessarily indicate it is the most dominant animal. Among Carpenter's howling monkeys, adult males seemed to lead; but the dominant hen in a flock is not necessarily at the head of a foraging group, nor is the dominant grouse the bird at the apex, though the dominant bird is apt to be well towards the front. Among cows the dominant animal does lead. (Allee 1942.)

Crawford (1942 a) tested pairs of female chimpanzees for dominance, working with eighteen subjects in fifty-four pairs. Dominance was determined by dropping food into the cage in which the two animals were confined and noticing which animal obtained it. He found by relating the results of such tests with other observations of behavior that the animal which 1) enters the other animal's cage first, 2) is groomed first by the other animal, 3) attacks or bluffs the other animal, is likely to prove dominant in the tests whereas subordination is most reliably predicted from 1) retreating, 2) vocalization, 3) grooming the other animal. These results were confirmed by later tests (Crawford 1942 b). In tests designed to test companionship preference in young chimpanzees, Nowlis (1941 a) found no relationship between companionship preference and dominance, or between such preference and food sharing. Food was only shared by a subordinate animal with a dominant one and not vice versa. In determining dominance and subordination Nowlis used the same food competition tests as described above. Through using this test a hierarchical dominance situation was demonstrated for the young chimpanzee subjects.

Maslow (1936 a. b. c. 1940, Maslow and Flanzbaum 1936) made a number of observations on various infra-human primates. He reports dominance a very obvious phenomenon in infra-human primate social life. "An experienced observer needs no objective test to determine the mere fact of dominance within a monkey group." Nevertheless, in his work, Maslow made use of the food competition test already described. By comparing the results of such tests with other observations he worked out what he calls "the behavior syndrome of dominance," and the percentage of occurrence of each element of the "syndrome" in association with dominance as shown by the food competition test. He found that the dominant animal 1) preempts the food supply (97% of all scores) 2) frequently mounts subordinate animals irrespective of gender (98%), 3) is rarely or never thus mated by subordinate animal (2%), 4) frequently bullies the subordinate animal (99%), 5) is never bullied by subordinate animal (1%), 6) initiates most of the fighting in the pair (85%), 7) never cringes under aggression (0%), 8) is rarely passive under aggression (1%), 10) is likely to be more active than his subordinate partner (65%), 11) is likely to do more grooming than his subordinate partner (62% - this does not agree with the observations of Crawford on female chimpanzees), 12) is likely to initiate more play (62%). Most of these criteria could hardly be called objective. In a group of six rhesus macaques every animal was paired with every other animal and the above "syndrome" confirmed except for grooming. Bullying and mounting were found to be the best criteria for indicating dominance as determined by the food competition test. Among these macaques an almost perfect hierarchy existed. It was found that when three monkeys were grouped together, however, it could not be predicted from knowledge of which monkey was most dominant in all possible pairs of the three which would dominate in the larger group. This was especially true if a monkey

dominant in the paired relationships was introduced into a group of monkeys subordinate to him in paired relationships, but which had been associated together for some time. In groups of three punishment was handed down from most dominant to second and second to the last. The middle monkey was more pugnacious toward the lowest monkey than was the dominant monkey. This is reminiscent of Schjelderup-Ebbe's observations on hens. Apparently there are variations in dominance behavior among different primate groups. Among young chimpanzees, for example, the dominant one is friend and protector of his subordinate partner who shows anger most often and chases his dominating friend, whereas a subordinate macaque will never chase a dominant one.

Having now seen that dominance-subordination hierarchies are practically general among vertebrates, let us see what information there is upon what determines dominance. Size and weight and health are often associated with dominance (Evans 1936 c and Maslow 1936 a, Schjelderup-Ebbe 1935). Murchison (1935 d) found a positive linear relation between dominance as determined by his "social reflexes" and loss of weight in grams due to starvation i.e. the longer a bird was starved, the more weight it lost, the less dominant it became. Murchison, Pomerat, and Zarrow (1935) attempted to correlate measurements of head, beak, wattles, comb, legs, toes, spurs, intestines, endocrines, blood count, chemical determination of non-protein nitrogen and creatin with the "social reflexes". No significant correlations were found. Uhrich (1938) found no clear correlation between weight and dominance in white mice. Adult mice usually defeated young males but not always. Allee (1938) says mature chickens usually dominate immature ones but that there is no great correlation between weight and place in the peck order.

There seems to be a relationship between feeding and dominance. Large, heavy, healthy active animals tend to be dominant. Those who get the food are the dominant animals, in turn they require the food for growth and maintenance of health and vigor. As we have seen, Murchison showed starvation reduced dominance. Harlow and Yudin (1933) suggest that dominance and subordination develop as a result of quarrels during feeding. Nowlis (1941 b) found that in food-competition tests dominant chimpanzees showed a higher dominance score after food deprivation. The score of subordinates changes only when the dominant was satiated.

Territoriality seems to have a definite effect upon dominance. Evans (1936 c) found that generally the largest male lizards stood at the top of the dominance scale, the smallest towards the bottom when placed together in a neutral area, but that the urge to hold their home territory often made up for a lack in size. Resident males won in 91% of fights and in 42% of these fights the winner was lighter. Uhrich (1938) found that mice fought harder and were more apt to be dominant in their home cage. Schjelderup-Ebbe (1935) reports some hens are dominant in one territory and subservient in another. Among canaries crowded together, there is no territory effect and the hierarchy is a simple one as shown in the table of the hierarchy among hens above. If the area is extended the birds spread out, establish territories and the hierarchical situation is made complicated by the addition of the variable of territoriality, each bird being dominant in the vicinity of its nest. Among pigeons some were dominant near the feeding pen, others at the roosts. (Allee 1938.)

Heredity plays a part in determining what animal is dominant. Allee and Ginsberg (1942, Allee 1942) found that certain inbred strains of mice differed greatly with respect to aggressiveness. The more aggressive strains readily dominated the less aggressive.

Sex also seems to be an important factor in dominance. Among some animals males seem to dominate, among others females. Murchison (1935 a & b) says the more dominant cocks are more active in treading hens. Guhl, however, (Allee 1942) found no connection between treading and dominance as long as the cock being tested was alone with the hens. Carpenter (1933 a & b) working with pigeons found that males usually dominated females. He found, however, that castrated male pigeons continued to engage in sexual activity, possibly because of stimuli presented by eager females to which they were conditioned to react. The overt behavior pattern of primary sexual activity was not changed essentially by partial or complete castration. Even a reduction of testicular tissue of 85% did not reduce the frequency of sexual activity though a reduction below 15% sometimes did cause such reduction which came about gradually. In a very general way, the more complete the castration the greater the reduction. A compensatory aggressiveness by the females was associated with some cases of partial castration and all cases of complete castration among the males. The billing activities between male and female

pigeons were reduced by castration of the males but the correlation between amount of testicular tissue removal and frequency of billing was low. To discover the physiological basis of dominance, Allee and his associates investigated the changes in the social structure of hens as shown by the peck order produced by the injection of certain hormones. To test the effect of thyroxin, five flocks of from three to nine hens were used. Hens in each flock received injections varying from bird to bird from .25 to 7.00 mgs. of synthetic crystalline thyroxin in an alkaline solution. The treatment had no noticeable effects on pecking order as long as the treatment did not produce severe moulting. Very large injections produced complete moulting and loss of social position in two hens (Allee, Collins & Beeman 1940). It will be remembered that Schjelderup-Ebbe (1935) reported that the lowest hens in the peck order were in poor physical condition which could be seen from the state of their feathers.

To test the effects of estradiol, four flocks of from six to nine hens were used. In each flock two or three hens received daily injections of estradiol dissolved in sesame oil, for a period of several weeks. In a control flock of eight hens no estradiol was administered. During the period of treatment with estradiol only two shifts in the peck order occurred which could not be attributed to ill health in the losing bird. In both cases the losing hen was receiving estradiol injections. (Allee and Collins 1940.)

The effect of testosterone proprionate on the peck order of hens was tested in a similar manner. This test produced marked changes. The injected hens rose and ultimately became leaders. With young pullets where the order was just established, no such change occurred but the injected ones had an advantage when meeting others. The injection of the hormone as well as producing social changes increased comb size, decreased or suppressed egg laying, and produced crowing among some hens. Discontinuance of injections led to a disappearance of these more physical changes, but a high social position once attained was retained for a long period. (Allee, Collins & Lutherman 1939.) Thus it will be seen that tests of the effect of hormone injection supports the observation that sex is important in determining dominance.

Evans (1936 b) found that females of the lizard, Anolis carolinensis, fought more strongly to defend their territories when castrated.

Uhrich (1938) in his study of the social hierarchy in albino mice found little correlation between frequency of copulation and dominance except in some cases of rigidly exclusive dominance (his first type or dominance). Castration, however, diminished fighting activity and so dominance.

Red deer are only sexually active during one period in the year. Except at that time males and females herd apart. During the period of rut, the males fight with each other, those successfully driving off other males acquiring a harem, over which they are dominant. This dominance, however, is unstable. When frightened, the female dominant before the advent of the male, again becomes dominant, the male making a separate escape or following the female (Darling 1937).

Among the new-world primates Carpenter's (1934) report on the social relations of howling monkeys would seem to suggest that males tend to dominate but this is far from certain. Relationships between males and females change according to stage of oestrous cycle but there is little indication that such changes are in dominance and subordinance.

Among the old-world primates, Carpenter (1942 a & b) remarks that among macaques, motivation for sexual activity is communicated by the female by posturing and other actions. He also found that the incidence of sexual behavior correlates highly and positively with dominance status in the group.

Zuckerman (1932) in his descriptions of the behavior of captive hamadryas baboons, found that the activities of the members of the baboon colony were largely controlled by the most dominant male. In a very great number of instances of dominance described by him, such dominance was manifested by sexual behavior. Even in the relations of one female to another in the female hierarchy the dominant female mounted subordinates. Dominance status among females was altered somewhat by their menstrual cycle. During the time of her greatest receptivity a female baboon was more closely associated with the dominant male and her position in the dominance scale rose. At such times she was sometimes permitted to get food which would otherwise have been appropriated by the dominant male. Bachelor males had only infrequent relations with females, as they were driven off by the dominant male unless his attention was thoroughly engaged elsewhere. When a bachelor male succeeded in decisively defeating the dominant male, he became dominant over the females as well as the other males. Observations of Chacma baboons substantiate Zuckerman's conclusions. Both of these observers

agree that the physiology of sex plays a very important part in dominance-subordination relations among baboons. Because of the very apparent changes in the "sexual skin" of female baboons it is easy to determine their stage in their menstrual cycle and thus to note concurrent changes in social behavior.

As for the apes, Carpenter (1941) reports that among the gibbons he observed adult males and females showed no very apparent sex difference in dominance and suggests this may be related to their lack of anatomical secondary sex differences. Yerkes (1939, 1940, 1941) reports from studies of paired males and females that among chimpanzees either sex may be dominant as determined by food competition tests, but that the male usually is. In a particular situation, however, dominance may shift. Changes in the menstrual cycle make considerable difference. Females when sexually receptive seem to control, males being in control at other times unless inferior to the female in "natural dominance". When female chimpanzees are grouped together, ordinarily subordinate females become dominant at time of maximum sexual swelling. When an older animal is caged with a younger the older is generally dominant but may be subordinate when the younger is at the sexual swelling stage. Crawford (1940) also concludes that among chimpanzees there is a tendency toward increased dominance in periods of genital swelling, but he reports (Crawford 1941) that in pairs of female chimpanzees dominance was not related to sexual behavior, which was infrequent, nor was it related to any particular non-sexual behavior. Maslow (1936 c) suggests that sexual activity among primates may be motivated by a dominance drive, rather than the other way around. He suggests that among primates there are two motives for sexual activity, dominance and reproduction.

There is, as shown above, considerable evidence that dominance and subordination among vertebrates is sexually determined. Some of the evidence, that of the injection of testosterone proprionate into hens, for example, is very impressive; other evidence, however, is much less so. Probably there is considerable difference from one vertebrate group to another in the degree to which sexual physiology determines dominance. There seems even to be considerable difference in this respect among primate groups, which may be seen from a comparison of Carpenter's studies on howling monkeys and gibbons with his studies of macaques and the studies of baboons by Zuckerman and Gillman.

Conditioning plays an important part in determining dominance. The animal winning out in a competition situation with regard to territories, food, or sex succeeds in establishing dominance. An experimental demonstration of the importance of conditioning in determining dominance has been made by Guhl and reported in summary form by Allee (1942). Guhl found that among cocks frequency of copulation was not related to their dominance status with regard to each other when they were alone with a flock of hens. When four cocks were placed together with a flock of hens a "psychological castration" of low ranking males developed which in some individuals was practically complete. For example, a cock designated Y stood second to cock R in a peck order of males. Y, when alone with hens, was aggressive and very successful sexually. When placed in an open pen with cock R, two other cocks and seven hens, Y was driven by R to the roosts whenever he attempted to approach a hen. He soon came to spend most of his time on the roosts, lost weight and became sexually ineffective. For some reason the dominant cock R did not similarly persecute cock G. When Y was placed with another flock of hens his sexual activity was uninhibited, but when placed back with the first flock of hens, even though the other cocks, including R, were removed, he was quite inhibited. The few times he did attempt to tread a hen in this flock he was strongly resisted, the hens having been conditioned with respect to him as well as he with respect to them.

Ginsberg and Allee (1942, Allee 1942) demonstrated the effect of conditioning on social dominance and subordination among mice. They used three highly inbred strains, a black and very aggressive strain, a white and quite pacific strain, and an agouti strain which was intermediate. The most dominant white mouse was exposed to attacks from black twice a day for six days. Thereafter he submitted to all white mice. Previously he held his status in one hundred forty fights with other white mice. After one hundred eighty fights he finally regained his status among the whites. White mice lower down in the dominance scale came back even more slowly when exposed to similar treatment. It was easier to cause an intermediate mouse to lose status than the most dominant mouse. Isolation helped recovery. The most dominant white mouse, when exposed to particularly severe treatment from blacks, avoided all approaches of all white mice. He only recovered his aggressiveness after four months isolation. By staging fights so that a particular mouse would win, that mouse could be gradually made more aggressive and raised in the dominance scale. This upward process, however, was slower than the downward one.

Besides the more or less objective determination of dominance and subordination in vertebrate groups, another more or less objective method of describing the social relations in such groups had been worked out, especially in the studies of primate groups. Implicit in Zuckerman's (1932) studies of baboons and Carpenter's studies of howling monkeys (1934) and gibbons (1941) is the estimating of frequencies of relationships between different individuals or classes of individuals in the group. For example, in his study of gibbons, Carpenter (1941) divides gibbons into adult males, adult females, juveniles 1, 2, and 3, infants 1, 2, and 3. A gibbon group may be made up of all these classes. Naturally relationships between adult females and infant 3's, a mother-child relationship, are close and frequent. As the infant grows older its associations with others of its age increase as do its relations with adults. The pattern of frequencies of relationships is stable when reviewed over a short period of time but gradually changes as young animals grow up. Somewhat less gradual are changes produced by the menstrual rhythm, relationships between adult males and females increasing in frequency during the period of maximum receptivity in the female. Though changes do occur gradually over a period of time, day to day relations are more or less stable and threats to the stability of this system of relations are resisted. Thus the group maintains a territory in which it can wander freely and from which it drives out other groups of the same species, though groups of a different species may occupy the same or an overlapping territory peacefully. Similarly wandering animals seeking to attach themselves to the group are chased away if they come too close. They stay as near as they are permitted and gradually as the group becomes adjusted and accustomed to them, they become integrated into it. Schjelderup-Ebbe (1935) reports similar phenomena among chickens.

Apparently for proper equilibrium of the group to be maintained a more or less definite proportion of adult males to adult females must be maintained. Zuckerman's baboon colony apparently contained too high a proportion of males. Since they were confined, extra males could not be driven away. As a result there were many and bloody fights until many of them were killed off. Among the gibbons Carpenter observed in the wild, young adult gibbons would gradually detach themselves or be detached from the group, somewhat the reverse of the process by which strong gibbons were taken into the group. The young adult which thus left the group might be either a male or a female, apparently depending on the situation of the group. Such animals probably become strays until taken into another group. Somewhat similar processes went on among the howling monkeys observed by Carpenter.

As was said near the beginning of this paper, only the more objective studies of animal social behavior were to be reviewed. It was also remarked that it was easier for the students of animal society to be objective in that they had to observe the behavior of their subjects, since they could not interview them, and so could not be misled by having to interpret verbal material of many possible meanings. The reader will note, however, that objectivity in these studies is not nearly complete. A glance at Maslow's criteria of dominance, listed above, will quickly demonstrate that. It would seem that such objectivity as is apparent is due in part to the necessity for observation rather than any great drive toward objectivity in the workers. This conclusion is more than justified upon examination of work done on humans by workers in the animal field. Maslow has made studies of dominance in humans (Maslow 1937, 1939). These studies are not studies of dominance behavior. They are studies of dominance "feeling" as revealed by statements of the subjects. Instead of carrying over the observed techniques developed in studies of monkeys, Maslow adopted the interview methods of the psychoanalyst. "Dominance feeling (or ego level) is an evolution of the self, operationally (sic) defined, it is what the subject says about herself in an intensive interview after good rapport has been established." Maslow then proceeds to try to relate "dominance" so established to such objective characteristics of the subject as "self-consciousness", "religious feeling", "conventionality", "morality roles", "envy, jealousy, suspicion, resentment, distrust" and so on. Allee (1938) after most interestingly describing much of the more objective studies of animal social relations, proceeds to write a chapter on "Human Implications" in which competition and cooperation in international affairs is discussed. There is no carry-over into the human field by these students of animal behavior of what objectivity they have developed in their animal studies. Nor have they carried objectivity in their own field as far as they might. Rather than attempt to establish how the determination of dominance can be put on operational and systematic basis, a complex or "syndrome" of traits is set down. No matter how broad this listing of traits, it does not include all the criteria used by all the students. "Dominance" as far as one can tell from the definitions given in the

literature, means different things to each student. Yet undeniably there is a common basis. Perhaps Chapple and Arensberg (1940) have set out what might be used as an observational and systematic basis for the determination of dominance. They suggest that fundamentally hierarchies, as developed among human beings, rest on the ability of one human to evoke simultaneous responses from several. Such a determination may be made quite objectively. There is no question of "bullying", "grooming" and so on, but simply of who acts as a stimulus producing a response in how many others in social interaction.

Before closing it might be well to reiterate that no attempt has been made in this review to cover the whole field of animal sociology. I have tried to select only those works that seemed to rest on a reasonably objective basis and which would be suggestive to students of human behavior. It is not impossible that I have overlooked works that would be as or more helpful than those included. If so, I should appreciate being informed of the fact. As the bibliography appended hereto is somewhat lengthy, readers of this review not familiar with the field it attempts to cover might like some indication of what works would be most useful to them. Allee's *Social Life of Animals* (1938) summarizes much material, almost all of it objective, his article "Group Organization Among the Vertebrates" brings things up to date. Crawford's article "The Social Psychology of Vertebrates" (1939) covers a very wide range of literature and has an extensive bibliography. Carpenter's *A Field Study of the Behavior of Social Relations of Howling Monkeys* (1934), *A Field Study in Siam of the Behavior and Social Relations of the Gibbon* (1941) and Zuckerman's *The Social Life of Monkeys and Apes* (1932) are excellent detailed studies of particular primate groups. Hooton in his recent *Man's Poor Relations* (1942) summarizes the literature on the social behavior of the various primates. While Hooton quite frankly says he is making no attempt to avoid anthropomorphizing, his summaries will be found useful and his criticisms penetrating.

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EDITORIAL STATEMENT

APPLIED ANTHROPOLOGY is a quarterly journal devoted to the solution of practical problems of human relations in the fields of business and political administration, psychiatry, social work and wherever else human relations play a part. It is based upon the premise that a science of human relations can only be developed if theories are tested in practice.

A prediction which is not susceptible of verification is little more than idle speculation. It provides us with nothing on which a science of human relations can be built. But if we apply the results of an analysis to the solution of a concrete problem, we have performed an experiment, and we have gained a laboratory to test our hypotheses. APPLIED ANTHROPOLOGY is primarily concerned with encouraging this kind of experimentation in the field of human relations.

During the last two decades, out of the varied efforts of anthropologists, human geographers, administrators in business and government, psychiatrists, psychologists, sociologists, social workers, a new field of science - human relations - has been defined. In spite of marked differences in the terminology and scope of many of these subjects, it has become recognized that all are concerned with the same general problems and that each must become increasingly aware of and use the methods and results of the others. APPLIED ANTHROPOLOGY is also concerned with bringing about this desired end.

The name ANTHROPOLOGY has been given to the publication because of the leading role which the discipline has had in roughing out a science of human relations. This circumstance has come about through the conditions under which anthropologists have had to work, rather than through any intellectual monopoly. First, anthropologists have had to work in the field, to gather facts by actual interview and observation. Second, each field worker has had to work alone, to remain unspecialized, or rather, he has had to combine in one person all the specialties. Because of this lack of specialization the anthropologist studied all aspects of people, he learned by experience that all these aspects were interrelated and hence he came to look at man as a whole. Third, most anthropologists have had opportunities to check their generalizations against mark-

edly different cultural situations. Thus when the anthropologist finally turned to consideration of his own culture, he had learned an objectivity and a general point of view which stood him in good stead.

Looking at man as a whole means that no aspect of human relations is omitted from consideration. Beginning with the premise that man is an organism, the anthropologist tries to explain man's behavior in terms of known physiological principles. He sees human relations, therefore, as the way in which organisms adjust to one another and to the natural environment. Differences in these adjustments bring about those individual differences we refer to as personality; and the differences in the ways of groups of individuals are related to one another make up man's institutions; familial, economic, political, religious and associational. The variations in complexity of institutions and in the adjustments of individuals within them are seen by the anthropologist as due to what he calls culture, the habitual techniques and routines making up man's adaptation to the external environment, which control the relations of people to one another and fix the limitations within which man has to adjust.

Because anthropology regards man as a whole in this sense, it can provide a unifying center around which a science of human relations can grow. The technological problems which plagued the people of an earlier day, problems of food and shelter and health, of more efficient means of transportation and communication, have largely been solved. We can look forward to increasing technical triumphs provided we are able to master the maladjustments in human relations resulting from technological change. At the present time, little attempt is made even to use what we already know in dealing with such problems. Only when the science of human relations becomes as fully developed as the older natural sciences can we hope to eliminate sources of individual maladjustment, bring about harmonious relations between the many groups making up a single nation, work out more effective and democratic systems of government, and extend their sway to the relationships between nations. Only with such a science can the basic problem of our civilization be solved - how to increase our human adjustment and at the same time to increase our technological efficiency. It is the hope of the members of the Society for Applied Anthropology that this journal will assist in this development.

For these reasons, APPLIED ANTHROPOLOGY will publish only articles which contribute to the solution of practical problems. In many cases, the results of a research may not be immediately applicable for reasons outside the control of the investigators. But in all cases, the practical use of the work must be clearly stated, and a method outlined by which the results of the investigation could be applied. In the early issues, we expect that there will be a greater number of articles in which no test of the author's diagnosis was carried out: before very long we hope to be able to publish a majority of articles in which an account is given of the way recommendations were arrived at and what the results were of putting them into operation. We are interested in failures as well as successes, provided an attempt is made to show what the reasons were for the failures. Primarily, then, APPLIED ANTHROPOLOGY is designed not only for scientists, but even more for those concerned with putting plans into operation, administrators, psychiatrists, social workers, and all those who as part of their responsibility have to take action in problems of human relations.